

# MILITARY REVIEW



**COMMAND AND GENERAL STAFF SCHOOL**

FORT LEAVENWORTH, KANSAS

•

A MONTHLY REVIEW OF MILITARY LITERATURE





Volume XXIII  
1943

Number 5

COMMAND AND GENERAL STAFF SCHOOL

# MILITARY REVIEW

MONTHLY REVIEW OF MILITARY LITERATURE



COLONEL F. M. BARROWS, *Field Artillery*.....Editor

MAJOR JOSEPH DASHER, *Infantry* .....Assistant Editor

CAPTAIN DON E. GRIBBLE, *Field Artillery*.....Assistant Editor

CAPTAIN CHARLES B. REALEY, *Army of the United States*.....Assistant Editor



August 1943



THE COMMAND AND GENERAL STAFF SCHOOL MILITARY REVIEW — Published monthly by the Command and General Staff School at Fort Leavenworth, Kansas. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rate: \$3.00 per year for 12 issues in the United States and possessions. Foreign subscriptions \$4.50.

## Acknowledgment

---

The editors desire to express their thanks and appreciation to those persons who have valuably assisted in the preparation of material for this issue. The work of contributors has been done in addition to their regular duties and gratuitously on their own time. We are very grateful to the following officers for their generous donations:

BRIGADIER GENERAL J. R. KILPATRICK	<i>Ports of Embarkation</i>
COLONEL R. ERNEST DUPUY	<i>War News and the Press</i>
COLONEL WALTER A. PASHLEY	<i>The Service Staff Course Ends Its First Year and Looks Ahead</i>
COLONEL RUSSELL P. REEDER, JR.	<i>Notes on Leadership</i>
COLONEL MARTIN C. SHALLENBERGER	<i>Changes at Leavenworth</i>
LIEUTENANT COLONEL ROBERT C. ALOE	<i>Use of Airborne Troops</i>
LIEUTENANT COLONEL GEORGE F. ASHWORTH	<i>The Naval War College</i>
LIEUTENANT COLONEL C. H. DONNELLY	<i>Artillery In a Penetration</i>
LIEUTENANT COLONEL JOSEPH C. GRUBB	<i>Artillery-Infantry Liaison</i>
LIEUTENANT COLONEL CHARLES L. MALONE	<i>Operations of an Induction Station and Reception Center</i>
LIEUTENANT COLONEL DILLMAN A. RASH	<i>Division Command Post SOP</i>
MAJOR H. C. EASTMAN	<i>What's Hard About Map Reading?</i>
MAJOR WARNER V. MADDOX	<i>Trains of the Armored Division</i>

Cover by PRIVATE BRAD STOUT, *DEML*, Fort Leavenworth, Kansas

# Contents

	Page
WAR NEWS AND THE PRESS .....	5
NOTES ON LEADERSHIP .....	8
USE OF AIRBORNE TROOPS .....	11
CHANGES AT LEAVENWORTH .....	13
PREPARATION FOR A MISSION BY HEAVY BOMBARDMENT .....	16
TRAINS OF THE ARMORED DIVISION .....	18
WHAT'S HARD ABOUT MAP READING? .....	23
THE ACTION AT TOROPETS .....	25
THE NAVAL WAR COLLEGE .....	27
INTERIOR LINES IN TUNISIA .....	30
OPERATIONS OF AN INDUCTION STATION AND RECEPTION CENTER .....	31
THE SERVICE STAFF COURSE ENDS ITS FIRST YEAR AND LOOKS AHEAD .....	35
ARTILLERY IN A PENETRATION .....	39
SEPARATE TANK GROUPS .....	43
ARTILLERY-INFANTRY LIAISON .....	45
MEN AGAINST TANKS—GERMAN METHOD .....	48
PORTS OF EMBARKATION .....	49
DIVISION COMMAND POST SOP .....	54
AT A GERMAN COMMAND POST IN RUSSIA .....	60
THE AMERICAN SHERMAN TANK .....	62
MILITARY NOTES AROUND THE WORLD .....	63
FOREIGN MILITARY DIGESTS .....	66
<i>The Atlantic Wall</i> .....	66
<i>An Advanced Observer For a Heavy Field Howitzer Battery</i> .....	68
<i>Tanks In a Forest Battle</i> .....	69
<i>Employment of Heavy Mortars In Defense</i> .....	70
<i>Tactics of Soviet Antitank Riflemen</i> .....	71
<i>German Experiences With Captured Soviet Cannon</i> .....	72
<i>The German "Tiger" Tank (T-VI)</i> .....	73
<i>Timor</i> .....	74
<i>Men of the Supply Train: Soldiers of the Front</i> .....	76
<i>Armored Artillery In the Soviet Campaign</i> .....	76
<i>Street Fighting in Stalingrad</i> .....	78
<i>Bombing: The Worm's-Eye View</i> .....	79
<i>Attack Across a River</i> .....	81
<i>Communication Installations In Firing Positions</i> .....	83
<i>External Bearing and the Spirit of the Troops</i> .....	83
<i>Mining the Gulf of Finland</i> .....	84
<i>Communication Problems in Tunisia</i> .....	85
<i>Clearing Minefields at El Alamein</i> .....	86
<i>Pantelleria—The Italian Malta</i> .....	87
<i>Russian Defensive Methods</i> .....	88
<i>The Role of Air Power in the British War Effort</i> .....	88
BOOK REVIEWS .....	91
SUBJECT INDEX .....	92

# Command and General Staff School



MAJOR GENERAL KARL TRUESDELL	-----	Commandant
COLONEL M. C. SHALLENBERGER, <i>Infantry</i>	-----	Assistant Commandant
COLONEL WILLIAM NALLE, <i>Cavalry</i>	-----	Director, Ground Force Instruction
COLONEL W. A. PASHLEY, <i>Quartermaster Corps</i>	-----	Director, Service Force Instruction
• CAPTAIN J. B. EARLE, <i>United States Navy</i>	-----	Director, Naval Instruction
COLONEL W. H. HARDY, <i>Air Corps</i>	-----	Director, Air Force Instruction
COLONEL D. C. SCHMAHL, <i>Field Artillery</i>	-----	Secretary

## Class Directors

COLONEL WILLIAM NALLE, <i>Cavalry</i>	-----	General Staff
COLONEL W. A. PASHLEY, <i>Quartermaster Corps</i>	-----	Service Staff
CAPTAIN J. B. EARLE, <i>United States Navy</i>	-----	Army & Navy Staff College
LIEUTENANT COLONEL F. R. SWEENEY, <i>Coast Artillery Corps</i>	-----	Air Forces Staff Course

## Chiefs of Sections

COLONEL S. T. SUTTON, <i>Infantry</i>	-----	Administrative
COLONEL H. J. SCHROEDER, <i>Signal Corps</i>	-----	Personnel and Administration
COLONEL B. M. LENNON, <i>Infantry</i>	-----	Intelligence
COLONEL L. H. COOK, <i>Infantry</i>	-----	Operations and Training
LIEUTENANT COLONEL L. F. WELLS, <i>Infantry</i>	-----	Logistics
COLONEL H. E. KELLY, <i>Infantry</i>	-----	Infantry Divisions
COLONEL W. L. ROBERTS, <i>Infantry</i>	-----	Armored Divisions
COLONEL W. H. HARDY, <i>Air Corps</i>	-----	Air Forces
COLONEL J. H. VAN VLIET, <i>Infantry</i>	-----	Service Forces



# War News and the Press

COLONEL R. ERNEST DUPUY, *General Staff Corps*  
Chief, News Division, War Department Bureau of Public Relations

NO WAR in history has ever been covered so thoroughly as today's struggle is being covered by the American press. The war correspondent is literally everywhere. On every front he—or she, for there are women war correspondents today too—works, and sometimes dies, under enemy fire—that you may know how the war is going on, how your men are behaving, in our war for existence. Some 376 correspondents stand today accredited by the War Department to the various theaters of war.

The American press has for its mission holding up to the public a mirror reflecting events of the day. The War Department Bureau of Public Relations in Washington, D. C., is the agency responsible that, so far as news of the Army is concerned, here and abroad, this mirror be polished and undistorted.

Everyone wants to know how the war is getting on. Some wish all details of each campaign, others are interested only in the highlights. On the other hand, there is not a single one who, if he finds the name of a relative, friend, or acquaintance in the war news, would not be even more intensely interested in this personal detail. That is why we have the old tried and true newspaper adage that names make news.

Correspondents get overseas into war zones only by War Department permission, obtained through the Bureau of Public Relations. When overseas, their activities are assisted by public relations officers on the staffs of the respective theater commanders. The news these correspondents gather is supplemented by daily communiques issued by commanders in all important theaters.

But furnishing the war correspondent with opportunity to see, and data on which to write, is but a small though essential part of the problem. The correspondent must be transported, messed, and sheltered like any other member of the force of which he is a component, for war correspondents under our Army regulations live under the restrictions of the Articles of War, and are treated in officer status as non-combatant members of the armed forces. If captured, they have this same status so far as nations abiding by the terms of the Geneva Convention are concerned.

The correspondent must write his story, must clear it through the censor, and then file it for transmittal to his newspaper, or talk it into a microphone. Neither high power radio transmitters nor commercial telegraph and cable offices are usually installed in active war zones. The War Department, realizing this, wisely provides that where commercial

facilities lack, the Army's own signal system is open to correspondents, subject always, of course, to military necessity, to the point where commercial communications systems can take up the load.

The same assistance is provided for the transmission of photographs. A system of radio wirephoto transmission has become a part of our Signal Corps installations on many fronts, over which not only Signal Corps and Air Forces photographs for American press use, but also photographs taken by the accredited press photographers are handled. The War Department Bureau of Public Relations channels these pictures to the press within comparatively few hours from the occurrence of the events themselves.

The news from the front gives the big picture of battles and campaigns, and outstanding accomplishments of individuals, which satisfy general reader interest. Above and beyond that both press and War Department must also satisfy hometown interest—the interest of every locality in its own neighbors. It is a very vital interest, this—the expression of the theme, "hometown boy makes good." The smaller the community the greater interest in local affairs—the little newsy personal stuff without which no community newspaper or radio station could live.

Here we come into the same field and the same medium which considers the painting of Jones' barn as worth printing. Well, if Jones' barn is news to the hometown certainly the Jones boy is news. Not the hero stuff alone, but the more prosaic facts of his progress in the Army—his promotion, his travels, his adventures, his well-being. There are several million Joneses in Army uniform today, there will be millions more tomorrow, and each and every one has some hometown link, some relative or friend or neighbor to whom his doings are properly of interest.

The burden of gathering and relaying the more personalized news of our men in the United States and abroad falls on the Army public relations officers. What they glean goes to the press of the regions interested.

In the Continental United States the Bureau of Public Relations clears correspondents of national media into our camps, where they are handled by camp and unit public relations officers who assist them in news-gathering. Local newspapers and correspondents make direct contact with the camp public relations officers, whose duty it is to facilitate the flow of general news to the press in the vicinity of their respective posts, and the much greater vol-

ume of personal news direct to the press of the soldiers' home towns.

War Department news and pictures are issued by the Bureau of Public Relations to Washington correspondents of newspapers and of the great press associations who purvey news to the daily press of the country. A group of these correspondents are assigned directly by their organizations to the War Department, where they have desks in our news room. A mat service, issued by the Bureau only to daily and weekly newspapers who have requested such service, supplements the daily flow of spot and feature news.

Casualty lists are also handled by the Bureau as they are received from overseas, and are issued to Washington correspondents after the notification of next of kin has been accomplished by the War Department. The compilation and issuance of these lists is one of the most important tasks of the Bureau.

As soon as records of decorations of our fighting men are received in the War Department, such lists too are issued by the Bureau, in order that word of the Jones boy's good work can be published to his justly proud family and friends.

So much for the War Department's very real concern that the people of our United States have the fullest possible information about the Army which is composed of their men, is supported by their money, and is fighting for them. Now for another and very important factor in the publication of war news.

Surprise is as essential in war as it is in the prize ring, on the diamond, or on the gridiron. The boxer who signals his blows is on the way to the long count. The team whose signals are known to the other side makes no squeeze plays, no brilliant offensive smashes. And in war, the commander whose intentions are published can expect defeat; the families of his troops to join the sorrowing ranks of the "next of kin."

That is why a single sentence penned by an American newsman a few months ago has such significance. Ray Daniell, head of the *New York Times'* London Bureau, wrote:

"There isn't any story in the world that is good enough to justify risking the life of a single American soldier." Mr. Daniell voiced there the logical reason behind the entire scheme of American war-time censorship.

For, since newspapers have existed, warring nations have sought, and found, in the press of their enemies and of neutrals, information vital to their own cause.

Before the invention of the telegraph there was not much to be feared from the daily newspaper. For instance, during our Revolution, while Washington was marching south on Yorktown, New York

and Philadelphia newspapers could have published his plans word for word without harm to the American cause. The news could not have reached Cornwallis in time.

But the telegraph quickened the press. *London Times* dispatches from the Sevastopol front of the Crimean War in 1855, gave dangerous information revealing the British strength and dispositions.

In the war between the States, newspapers on both sides were guilty of the most shocking revelations, from the military viewpoint, resulting in prolongation of the war and the slaughtering of thousands of men.

Overseas, the Prussian high command took the lesson to heart in the Austro-Prussian War of 1866. Thanks to the submarine cable, London was by that time the news center of the world. The Austrian plan of concentration leaked out of Vienna, was published in London newspapers and relayed to Berlin. The elder Moltke, Chief of the Prussian General Staff, organized the Prussian advance to take advantage of the fact, and went on to quick victory.

In the Franco-Prussian War of 1870-71 German officers in London studied the British newspapers and fitted scraps of information into mosaic revealing French movements and strength at vital points. The biggest disaster resulting from that was Sedan, September 1, 1870, after a London newspaper dispatch disclosed the French movement to relieve the siege of Metz.

In our own Spanish-American War of 1898 the United States press disclosed our movements and intentions time and again. Fortunately our enemy could not take advantage of the disclosures.

The wily Jap clamped down on war correspondents in the Russo-Japanese War. In the Great War the chains of military censorship began to rattle, despite the birth of a new communications channel, the radio telegraph. And for a long time war correspondents had much trouble getting any news through military censors.

One of the greatest triumphs of military censorship occurred in France in 1917, just ten days after the United States had declared war on Germany. The French Nivelle offensive was launched April 16, and failed. Six weeks later a large part of the French Army was in mutiny. But the Germans did not know—neither did we, for that matter. Before General Pershing ever arrived in France a confidential report to the French War Ministry, April 24, 1917, stated—and I quote: "By the end of the summer we will have guns, planes, to say nothing of the Americans—but there will be no French soldiers." A determined German drive would have won the war then and there. But the Germans didn't know. French military intelligence had choked the news; delayed it until it was too stale to be of any use to the enemy. That was plain suppression of



news. Was it justified? Answer to this question is left to readers.

In the early Spring of 1918 the publication of a letter of sympathy to the parents of a German aviator killed in action, read and passed on by a British agent in Berne, Switzerland, disclosed the fact that General von Hutier, heretofore a successful leader of violent offensives against the Russians, was now on the Western Front, opposed to the British Fifth Army. Here was the tip-off that a German offensive was coming. The tip was not acted on, unfortunately, for it came—the great offensive of March, 1918, which smashed the Fifth Army and nearly ended the war in Germany's favor.

These are a few of many examples which led to understanding of the problem of military censorship by our own high command as we entered this war. Regulations guiding war correspondents were ready, designed to protect the press as well as the nation. These regulations were tried out in the mass maneuvers of 1941, when the War Department for the first time insisted that war correspondents become partisans in sham battle. Graduates of these maneuvers are filing war news today in all parts of the world, have accompanied each of our major task forces, have kept the faith as American citizens.

These correspondents are governed in their writing by military censorship imposed by the task force commander with whom they serve. This censorship is obligatory, in contrast to the voluntary censorship here in the United States.

Here we come to one of the most amazing situations which our American press has ever encountered—a censorship by which a free press governs itself in voluntary compliance with a code set up by newspaper men for newspaper men. Our press and our people owe much to the Office of Censorship, under the guidance of Mr. Byron Price and his assistants, who have absorbed the principles of military security and have set up a common-sense code

based on one primary consideration: Will this news help the enemy? If the answer is yes, the story should not be printed.

"Why," asks Mr. Price, "put at enemy disposal, anytime, anywhere, the expert fact-finding machinery built up by the American press through years of patient struggle?"

Let's illustrate this point of helping the enemy. After Pearl Harbor a hue and cry went up throughout the United States that our people should be informed of the exact extent of the damage incurred. The American people could bear the shock, said the claimants; they should know all. As for the Japs, they argued, the Nip had been there; he knew what damage he had done.

There is no question of the American people bearing the shock. Of course we could. But the enemy's knowledge is another thing. Let's see how much he did know. On February 6, 1942, two months after that fatal day, the Nip officially claimed eight American battleships; on March 8 he claimed five; on May 27 he put the score at six. Obviously he was fishing. Rumor is one thing, confirmation another. And until and unless the enemy knew exactly how much damage he had done, unless he was sure that our battle fleet was out of the picture, he would not—and the proof is he *did* not—risk sending his battle fleet and a great armada of troops to invade our shores. He did not even try to invade Hawaii. He was not sure. He had no real yardstick to gauge our conditions.

The fog of war is very real. Every rift in that fog disclosing American strength and intentions to the enemy means death to American men, damage to our cause. Unless we ourselves play the sun of news on that fog, the only way the enemy can clear it up is to fight for his information, to pay for it in flesh and blood. That's what we want.

What the enemy does not know cannot hurt the United States.

---

The uniform should not be an insulation against mental activity that isn't directly military. The soldier who understands what is going on in this world and where it is taking place, who knows in his mind as well as in his heart what America means, what America will continue to mean, and what is his responsibility to preserve and carry on the traditions of the Republic will be a soldier who will undertake the rest of his military work with greater zeal to perfect himself as a soldier, to make himself fit to fight for the country that is the greatest beacon of hope for the preservation of the institutions of free men in this war that has challenged freedom.

—Lieutenant General Ben Lear.

# Notes on Leadership

COLONEL RUSSELL P. REEDER, JR., *General Staff Corps*

**A**N HONORED COLONEL, on hearing that the Corporal of the Guard had shot the Sergeant of the Guard and that the Corporal "didn't know it was loaded," said with great vehemence, "Oh, woe is me! Why didn't they tell us about these things at the War College!" He was speaking metaphorically and wrathfully belittling his education in the subject of leadership as well as his ability to cope with the lack of training in his green regiment. In reality the colonel had received instruction in leadership at the War College. To complete the story, his regiment distinguished itself in action against the Japs, and the Colonel earned a well-deserved star on the field of battle on Attu.

One of the best works available on the vital subject of leadership is a lecture which was given to the students at the Army War College by a renowned leader of World War I, Major General Hanson B. Ely. General Ely gave this lecture a number of times, the last time being in February 1940. It is especially beneficial for us at this time to review the principal points of his observation. His observations on this subject are as pointed today as they were when the country was embroiled in the first war against the Germans in 1917 and 1918. Notes on General Ely's lecture follow:

"A leader must be:

- Unselfish
- Have brains
- Have a degree of physical fitness
- Courageous
- Energetic
- Loyal
- Possessed of strong common sense
- He must have the confidence of the men
- He must have a creative mind.

"The *real test of leadership* is the application on the spot of all these attributes to existing conditions, with a decision put in writing, or in the shape of definite orders and instructions, supervising their execution.

"When one hears the first bullet go by he thinks it was awfully close and that the next would get him; one's flesh squirms. But one gets used to it after a while and perhaps comes to be more or less a fatalist—that is the best condition. Death is the thing that most people fear. If you can get your men to be fanatics or fatalists you have the best kind of command.

"The tide of battle is in the hands of *each* fighter, and never, at any time, has the individual bravery of the soldier had more importance.

"Whatever the science of the superior commander, the genius of his strategic combinations, the precision of his concentrations, whatever numerical superiority he may have, victory will escape him if the *soldier* does not properly conduct himself without being watched, and if he is not properly animated by the resolution to conquer. (Think this one over. The problem that confronts unit and organization commanders is how to drill this into all of the men of the command.)

"There is one thing that is surprising to those who enter combat for the first time, no matter what their studies or observations may have been. That is, during combat your troops get out of hand—you do not know where they all are, so do not know where to put your artillery down, etc. That is one thing that should be remembered—in the early stages of a serious battle you will invariably find, from sources that you may judge to be trustworthy, rumors and reports of disaster. There should be written in large letters—

*"Be very careful, especially in the early stages of a battle not to commit your reserve prematurely on account of improper information. It would be better to take the chance of further disaster than throw everything in you have."*

"The reserve is the final thing which decides battle.

"Men must be so trained that when they have been in battle for days and nights, when perhaps they have been badly handled by the enemy, and have had heavy casualties, yet when the signal comes to go they will go again to the *limit of their endurance*. That is another thing that should be put in LARGE LETTERS—that is the *last 5%* of the possible exertion that often wins that battle. That has been the observation of our best men—that it was not the first attack or the second, or the third in which perhaps they had lost 40% in casualties, but it was the *last straggling fourth attack* that only got two or three hundred yards and was engaged in only by one-tenth of the command, that led the enemy to believe that the command still had a *little more punch left*, and caused him to withdraw.

"Putting men in the guard house in war-time gets them behind in training, and the enemy ahead. Squads then do not have 1 Sergeant, 1 Corporal, and 11 Privates. *Every possible bit of your leadership is needed to keep as many men out of the guardhouse as is possible.*

"A man will do more for Company 'A' than he will for General So-and-So. He will do the most for

a group which is banking on him, who will know him for a brave man or a coward. The answer: cultivate Platoon, Company, Battalion, and Regimental Spirit.

"The quality of the men is O.K. regardless of the section of the United States they come from, but the great difference in the success and failure was on account of the quality of the leadership.

"Very few are normal in battle. It is the leader who can retain his *normalcy* the longest that is going to win out, whose judgment is not changed or injured by fatigue, weather, lack of sleep, or nervousness as to whether he is going to be defeated. The man who retains his judgment through all these things is going to be the leader.

"The Germans infiltrated a lot (as the Japs are prone to do.) They came through gaps in our lines, reorganized, and fired on our rear. It takes *disciplined* troops to stand them.

"At Blanc Mont we *expected* infiltration and we got it, but the troops *were told ahead of time* that there would be an infiltration, that we would get the enemy, that they could not infiltrate as many men as we had. They tried infiltration, but it didn't worry anybody because the Division organized for this, and our troops were disciplined.

"A common mistake in the A.E.F.: Calling the subordinate far to the rear for conferences, or instruction, during battle or when battle is imminent.

"Know your men. Be at the front lines on proper occasions and frequently. See that hot food and supplies reach the troops when possible. Make thorough preparation for every contingency that can be seen. Show interest and sympathy for your men. Develop an organization spirit. Punish those who should be punished but never in anger. Reward those that merit reward. This will build up confidence in the leader by his command.

"Private to General are *partners* in interest in the war, and in the 'ownership' of the unit.

"Reasons officers were relieved from command in the A.E.F.:

- (1) Officers who were critical or even disloyal to their superiors.
- (2) Officers who reported that their commands were tired and discouraged, when they themselves were tired and discouraged, while their units still had fight in them relative to others available.
- (3) Officers who kept in their dugouts when critical conditions demanded their presence."

Pictures of the Civil War and the Spanish-American War show officers and men on the battlefield rallying around the flag of their country. In the '20's, student officers were told that the colors do not go into action because they would help to identify the target for the enemy. Young student officers accepted this, some secretly regretting this doctrine.

When our troops landed in Africa, they carried the colors, and they also had small United States flags sewn on the sleeves of their battle dress. An officer in describing this landing stated, "Our troops went ashore with colors flying. I know the flag inspired them. It inspired me, and the sight of our men fighting directly under the colors was a never-to-be-forgotten sight."

A news picture of a United States camp on Attu, taken during a recent action, shows officers and men in a camp which is apparently protected by an outpost. In the center of the camp, the colors are flying from a stout staff which is about ten feet high. When one looks at this picture, it does not require a great deal of imagination to realize that officers and men in those bleak surroundings drew both strength and courage from the flag.

When our troops were in Ireland, before being shipped to Africa they were billeted in good surroundings and in fine camps. However, they were in a strange land. An Armored Force leader states, "We raised the flag in our camp on July 4th, 1942. You should have heard the men and officers cheer!"

When leaders fail in battle and have to be replaced, teamwork, loyalty, and confidence all suffer. The place to replace faulty leaders is in the United States and not in the Combat Zone. One leader found it necessary to replace quite a number of the officers and noncommissioned officers of his regiment just prior to and during action. The regiment was held together at this time by the determined leadership of the regimental commander and by the staunch support of other leaders of all ranks throughout the regiment. By their leadership this regiment found itself and produced under fire. The leaders who went through this trying period of reorganization in the combat zone are among the first to endorse the importance of the old Army saying—"Get the stripes and insignia on the right people." And to this saying one might add—"in the United States."

In the January issue of the Command and General Staff School MILITARY REVIEW there appeared an article on the "Confusion of Combat." This article gave some excellent pointers on conduct on the field of battle. A famous Marine Division has adopted a Standard Operating Procedure to aid in eliminating the confusion of combat. When reports come in, as they appear to do in every battle, along the lines of "K Company has been wiped out" or "The First Battalion is surrounded," the Marine officer receiving this report directs the officer making the report to go in person to the point where the alleged calamity has taken place in order to make a personal check on the action. The Marines have



found that this procedure reduces the confusion of combat.

A Lieutenant General in our Army at a meeting with his senior commanders said, "I have noticed that some officers do not know that the most desirable characteristic for a military man is DEPENDABILITY. Recently, a high ranking officer came to me and said, 'A General Court has sentenced Captain So-and-So for being drunk on duty. Will you help get him out of this? He is one of the best machine-gun instructors in my command.'

"The senior officer who made this request has not learned that the quality of DEPENDABILITY outweighs all the rest. In over 40 years of service I have found out that a dependable officer, even though he may be slightly dumb, is much more valuable than a brilliant officer who is undependable. The latter will do wonderful work 364 days of the year and on the 365th day he will throw you down at a critical moment and will make you wish you had never heard of him! *This is especially true in action.*"

The soldiers cry of "When do we eat?" may irritate young and inexperienced leaders, but the leaders should give heed to this. It is the soldier's way of inquiring of his leaders as to his next meal. Officers must bring themselves to the realization that their soldiers work when they (the officers) order it; that they sleep when their officers arrange for them to sleep, they perform guard and other duty

when ordered to do so; that the very life and death of the soldier in war-time hinges in a large measure on the orders of their superiors. The officers must learn to care for their men.

The leaders must be moral. Officers living as close to their men as they do in a war have their very speech and habits mimicked by the men. If the leaders cannot meet the moral standard expected of them, the conduct of men will be poor.

Almost all observers returning from the combat zones state that, in our training, vigorous small unit leadership must be stressed and developed. Headquarters, Army Ground Forces, in a recent training directive states that "All non-commissioned officers and platoon leaders must be taught to accept responsibility, to be self-reliant, to act 'on their own' when the occasion demands, and to lead their troops successfully in difficult and hazardous undertakings. Squads must be capable of independent action. Exercises will be conducted solving this problem." Many are accomplishing this by making sure that the junior leader understands what is required and then holding him responsible for results. Nagging is left by the wayside. Small unit leaders are responding to smart leadership. A master at handling men is a delight to work for. Perhaps you have heard the expression, "Hell, he's easy to work for—he just expects results!"

## The Making of a Combat Soldier

[From an address by Major General Louis E. Hibbs to the 63d Infantry Division upon activation.]

CERTAIN SKILLS are required of the soldier. These can be learned relatively quickly. Efficiency in these skills, however, requires constant practice, until the body and mind have become so disciplined in their execution that correct performance becomes automatic. Then, and then only, is the soldier ready to use them in combat.

Mere proficiency in his required duties is but a good start in the production of a combat soldier. He must develop, in addition, the strength, physical and mental, which makes him the fighting man. There is no easy road to acquiring this physical and mental stamina. It is the product only of his hard physical work, and of toil and strain under adverse conditions. This you will remember: You are to be trained for combat by requiring of you tasks deliberately designed to produce conditions of hard physical work and mental strain.

As your training progresses, these tasks will increase in severity. This work will be performed under combat conditions of weather, shelter, food, and sleep—you will be required to perform your combat missions in the midst of the noises of the battlefield and the danger of real ammunition fired over and near you. You will be taught to take it the hard way—and you will learn to glory in it—so that you may develop the qualities that make a man, and emerge as a fit companion for the fighters of this nation—fit to bear the rigors of combat—to laugh off discomfort and ill fortune—to have the physical ability and the will and skill to drive to victory.

When the going gets tough in the months which lie ahead of you remember that your leaders are seeking to put the iron in your soul that will make of you—what you in your own pride would seek for yourself—a combat soldier.

# Use of Airborne Troops

LIEUTENANT COLONEL ROBERT C. ALOE, *Infantry*  
Instructor, Command and General Staff School

HAVE YOU ever been in a division command post when the commanding general and his staff were in a fret about the threat of a parachute landing? What happened? In all probability at least one battalion was kept on mobile alert and out of the main fight. In addition it is probable that all radios that could be spared (and many that couldn't be spared) were placed in an anti-parachute net. Also it is a safe bet that all the troops were harassed to furnish protection to command posts and supply installations. If the threat of parachute attack can disconcert staffs and immobilize units to this extent, just think of the units that will be immobilized or at least held in passive defense with the primary mission of anti-airborne troop action if there is the threat of an Airborne Division being used against them.

The German airborne attack against The Hague in May 1940 is a good example of the threat of airborne troops immobilizing fighting troops. These German attempted landings in the vicinity of The Hague were admittedly a failure so far as accom-

plishing their mission was concerned, yet it is said that the threat of further air-landings immobilized four Dutch divisions that were badly needed at the front. Looking at the problem of the use of airborne troops from the attacker's point of view the question is: How should an Airborne Division be used? The

answer is obvious: To strike at a vital spot in the enemy's rear in order to assist the main effort. Notice that the emphasis is on the word *vital*. It is easy enough to use such expressions as, "Strike at a vital spot in order to assist the main effort," but let's consider some of these "vital spots" and see how striking them from the air can assist the main effort.

First, let's see how an Airborne Division could be used in conjunction with a seaborne invasion. Consider Figure 1. The mission of the main effort is to establish a beach-head at A. Assuming that the enemy has a fairly strong beach defense and a good size mobile reserve at X, there are two ways the Airborne Division can assist this landing.

1st.—By landing in the vicinity of X to prevent the movement of reserves and supplies toward the threatened beach.

2d.—By landing immediately behind the beach defenses and attacking them from the rear to assure the landing of the first waves of seaborne troops, thus assuring the first foothold on the shore.

A second use of an Airborne Division might be to assist a major ground attack.

As an example let's look at a penetration as represented in Figure 2. Suppose the main effort is to be made as indicated, that the enemy has reserves

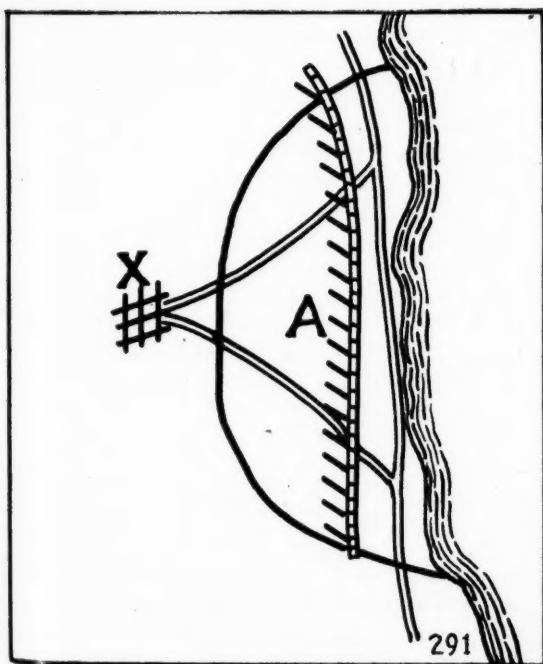


FIGURE 1.

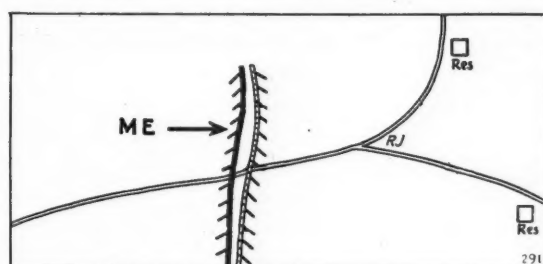


FIGURE 2.

as indicated; an Airborne Division dropped at RJ to prevent the movement of reserves toward the front would certainly aid the main effort.

Another example would be where the ground forces expect to break through the enemy, but have a large river to cross several miles behind the enemy lines (Figure 3). An Airborne Division dropped to capture the bridges at X and Y, prevent their destruction, and keep reserves from crossing from the east would decidedly aid the main effort. The confusion caused in the enemy forces west of the river by the threat of an attack from the rear and the disrupting of communications would work adversely on the enemy.

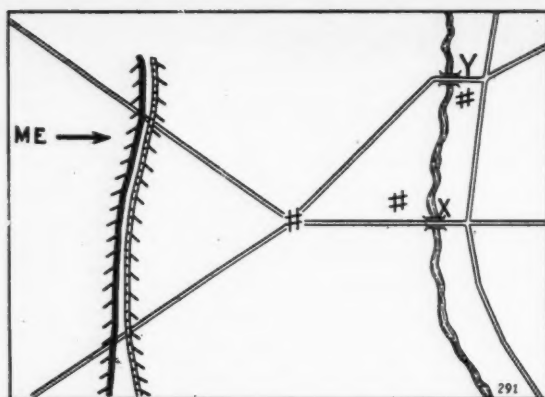


FIGURE 3.

An Airborne Division might be used close behind the enemy artillery area (Figure 4) with the mission of striking the defenders from the rear, disrupt-

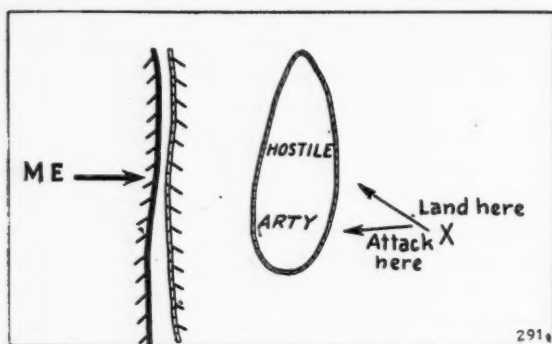


FIGURE 4.

ing communications, or destroying command posts and supplies. Necessarily the enemy would be forced to detach combat troops from the main defense to counter the airborne threat.

The third general use of an Airborne Division is to assist an armored exploitation.

If the armored forces are to pass through a gap in the enemy defenses but still have an important mountain pass to traverse later (Figure 5), an Airborne Division could very profitably be used to secure the mountain pass to assure the passage of

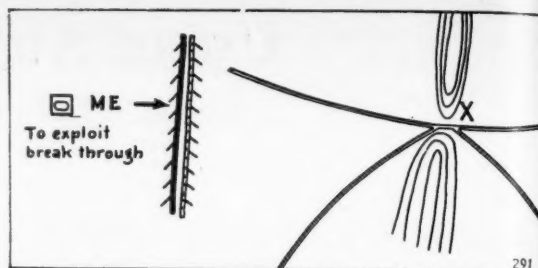


FIGURE 5.

armored units while denying its use to retreating enemy or to enemy reserves coming from the rear.

Again, in assisting the armored units, as in the case of an expected breakthrough (Figure 6), an Airborne Division landing near the port B to de-

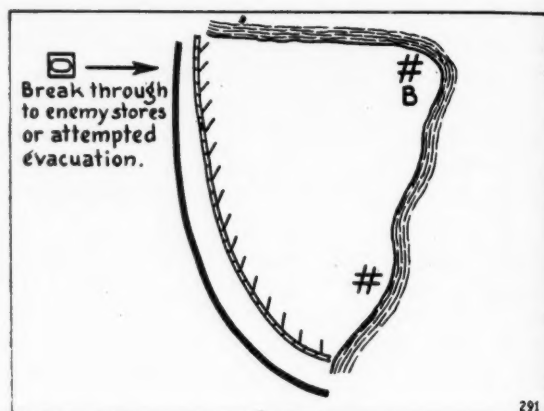


FIGURE 6.

stroy stores and prevent evacuation would certainly cause consternation in the enemy's ranks.

Summarizing then, several important facts stand out in all three of the above uses of an Airborne Division: first, the Airborne Division will attract hostile reserves, even from the main defense; second, since the Airborne Division cannot be expected to exist long in the enemy rear, it must be reached by the main ground attack within a reasonable time; and third, airborne units used at vital points can aid the main effort immeasurably.

The spot where we intend to fight must not be made known; for then the enemy will have to prepare against a possible attack at several different points; and his forces being thus distributed in many directions, the numbers we shall have to face at any given point will be proportionately few.

—Sun Tzu—500 BC.



# Changes at Leavenworth

COLONEL MARTIN C. SHALLENBERGER, *Infantry*  
Assistant Commandant, Command and General Staff School

IF ONE IS AWAY and meets old graduates of the Command and General Staff School, they ask you, "Has Leavenworth changed?" Well, the answer is yes and no. The physical changes are few. As you come down old Grant Avenue the same rows of gigantic elms greet you. They are bigger and more luxuriant but still quite the same. The quarters and administrative buildings on the post appear exactly the same. The only thing about the general appearance of the post is that it is a little older, greener, and more dignified in appearance.

## PHYSICAL CHANGES

When we look more closely we find that there are a few things which are new, especially to those who have not been here since the war began. The first and largest addition to the post is the Reception Center, located on the west side of Grant Avenue just before you reach the lake. This is a war-time cantonment of the better type and is beautifully kept up. It receives and discharges hundreds of men a day and has a daily attendance for meals of some thousands. It is a model institution of its kind. There has been a practice of sending commanders and staff officers of new reception centers to this one as a model of how one should be organized and run.

The next largest new item to meet the eye is the so-called Auditorium built behind the Administration Building on the area just east of the Riding Hall. This is really a war-type sports arena converted into an auditorium. It contains two large lecture halls, one capable of seating 600 students at desks, the other 250. It is now the home of the Service Staff Class.

In addition to the Auditorium, a number of other buildings have been converted into student classrooms. The largest of these is the remodeled Riding Hall now called Gruber Hall. All the students who labored there with equitation would be astounded to see what has been made of it as a classroom. The floor has been laid in concrete and has been terraced to aid vision, and there is an arched ceiling throughout which makes the halls acoustically perfect. The result is perhaps the largest classrooms in the world. The old arena space was made into two classrooms, the larger capable of comfortably seating 1,200 students at individual desks, and the smaller accommodating 420 at desks. In the larger classroom the instructors have to use a microphone, but the acoustics are so good that only a small amount of amplification is necessary, and by using the lapel-type microphone there is no inconvenience whatever to instruc-

tors in giving any type of presentation. In fact, we are able to give demonstrations with many instructors on the platform, all of whom wear lapel microphones. In the smaller hall no microphone is necessary.

One of the greatest technical difficulties overcome in the larger of the Gruber Halls was the installation of a motion picture machine, motion pictures being an important adjunct to modern instruction. To project a picture clear across the larger of the two halls was a problem. It was found to be the longest reach in America and probably in the world, and special bulbs and sturdy supports for the machine were necessary to make the projections successful. However, it has been accomplished, and motion pictures are used frequently as illustrations in instruction.

Gruber Hall is the home for the General Staff Class.

Old Pope Hall, the social and theatrical center for so many years, has also been converted into classrooms and houses the course for New Divisions. Both the main and the lower floors were completely redone, acoustic properties were improved, and it is now an excellent hall for its purpose. It is capable of handling 150 to 160 students very comfortably.

Another building which few people would have thought of as having any possibilities for the purpose, was converted to academic use. That is the large red brick building, behind the academic building, which was for a long time used as noncommissioned officers' apartments. It seems that it was originally built by the Masons as a Masonic Hall; and after ripping out the partitions and false ceilings of the old apartments, it now contains a fine spacious hall which will accommodate up to 180 students and which has two additional conference rooms each large enough for 50 to 60 students. The lower floor of this building has been converted into offices for instructors.

In the academic building the old classrooms in Grant, Sherman, and Sheridan Hall have all been re-done so as to increase their capacity and improve their acoustic and other qualities. They are used for special courses that are given from time to time and for the different sections of the other classes when they divide up into groups by arms or general staff sections.

One of the really new buildings on the post and perhaps the most beautiful is the new Golf Club building on the site of the old Golf Club. It was built with funds from the Golf Club reserve and with the

aid of WPA labor. It is first class in every respect—spacious, dignified, and usable. Its swimming pool is in use throughout whole days of the hot summer by students and post personnel at every opportunity, and its ballroom is the scene of relaxation for the week ends. The golf course is perhaps at its best and is used as much as time permits. All of the activities provided by the club for relaxation are especially essential due to the tension and strain of the very concentrated type of courses now given.

The Command and General Staff School is no longer a college but is really a university. Four or five courses are going on concurrently, each one carrying out a special mission. The resultant output is over 6,000 graduates a year, which perhaps makes it the largest university in the world. One might ask, "How can you accommodate 1,000 to 1,200 students under conditions suitable for intensive study?" Well, it has been easy. The old barrack apartments on Pope and Doniphan, the Beehive, and the Artillery Barracks have been turned into student quarters. Six to eight officers in an apartment accommodates them comfortably so that only in a few cases does a student have to share a room with another. However, we leave the sleeping and study arrangements to the groups in each apartment. The old Service Club is now a mess hall for 700; 300 officers can mess at the Golf Club mess, and 250 in the old bachelor officers' mess on McClellan Avenue. That takes care of everybody, and in fine style. Everyone is comfortable and eats and sleeps like a gentleman.

#### ACADEMIC CHANGES

So much for the physical changes. The academic changes are more pronounced. There are many of them, but they have not in any way changed or lowered the high standards which have always characterized the instruction given here. However, during this wartime program the old classical style of instruction has been replaced by a more practical style—one that has been made necessary by the pressure for speed and direct action. It was decided at the outset of the war-time courses that in order to accomplish our mission under the war-time pressure we would have to shoot straight at the marks required by our missions. Throughout this period we have been training directly and solely for wartime jobs—and by specializing we have been able to get very far in our instruction—much farther than most people would realize. By specialization, by the elimination of cultural subjects, and by lengthening the hours and days, we have been able to go in the nine weeks about as far as we went in the old days in six months.

At the present time there are four distinct courses being conducted at the school. The largest is the one known as the General Staff Course whose mission is to produce General Staff officers, Air Staff officers, and Special Staff officers for divisions and corps or

similar units. The size of this class is usually between 700 and 800. The next largest class is called the Service Staff Course whose mission is to produce staff officers for duty in the zone of the interior and the lines of communications in the various theaters. Its size varies from 250 to 300. The third course is known as the New Divisions Course. When the new divisions are now created, the commanding general and his staff assemble here at the school. They meet here for the first time, and in reality the division is born right here at that moment. This group, consisting of 20 to 25 for each division, is then given a course of instruction lasting four weeks, the purpose of which is to refresh all of them in the current doctrines of the War Department and to weld them into a staff team. It has been one of the most successful courses the school has ever given as the staffs have left here all brought up to date, refreshed and polished up on technique, all talking the same language, and all acquainted with one another and eager to go to their task of starting the organization of their division. The practice has been to send two, three, and up to five divisional groups at a time. We have had all types: Infantry Divisions, Armored Divisions, Airborne Divisions, and Cavalry Divisions. The instruction given to each of them is solely on subjects that pertain to their own individual type of division.

The school has given four courses to groups of civilians selected from those who are interested in or contributing to the war effort. The classes have run about 90 in number, the course being directed towards giving them an over-all picture of the Army, how it operates, and what its requirements are at various times, so that those attending can have a better picture of the part they are to play in the total war we are now conducting. All who attended the courses have pronounced them great successes. These courses have been suspended during the hot summer months but will probably be reopened in the fall.

We are now conducting a new course for selected naval officers who are destined to take part in the higher staffs for joint operations. They are sent here for a one month's course to learn the Army's ways of doing things. The first one of these courses has recently been completed, and there probably will be others every two months.

There is still another course in prospect which may open shortly for the purpose of training young air officers for duty on the staffs of air units of theater commanders. It will be a short course destined to give these officers staff technique which they will then apply to the staff problems of their own arm.

As stated above, the keyword in all of our war-time courses has been specialization. In the General Staff Course, for the first eleven classes the specialization was by the four general staff sections. At the beginning the students were from the various newly

formed divisions and were the staff officers who had had little training in staff technique, or they were the assistants or prospective candidates for those jobs. In any event they came to the school earmarked for the various staff sections. About two-thirds of the course was in specialized training for the performance of the duties connected with the section for which they were specializing. It was a very successful period for the school, for by following that program we were able to teach them all we knew about their specialty. However, the time came when the students who came here were no longer truly destined for a job in a staff section but were only being trained as a reserve for staff purposes; and we found that too often they were put into staff sections other than those for which they had been specially trained. The result was that specialized instruction was lost and they lacked a more general education. To correct that, in the last three classes the program has been changed so that students are instructed in all four staff sections alike; and the specialization is now done by the arm in which the student is expected to serve: that is, the class is divided into groups for instruction in the employment of Infantry Divisions, Armored Divisions, or Air Force units. Specialization by arms had already begun in the earlier classes, but now the specialization is almost complete. Only the most basic subjects are given to the class as a whole, together with a certain amount of instruction in all of the arms, so that all the students know the basic principles of the way in which the various types of troops work. Under the new program the basic and common subjects comprise perhaps one-

third of the program while separate instruction comprises the remaining two-thirds. For map maneuvers and other group work, each student is employed with troops of his own arm wherever possible.

In the Service Staff Course we have thus far been unable to specialize, as the students do not come to us with any definite earmarks. We have the two rather distinct fields of activity: the work in the zone of the interior and that of the lines of communication overseas. About half the students go to each of these activities, but we do not know to which one at the beginning; so we must treat them all alike.

The quality of instruction is, we believe, the best it has ever been. It has been modernized in every possible way, and every effort has been made to make it effective. All modern aids and means for that purpose are employed. We have had the benefit not only of the best instructional talent in the Army but also that from many sources in civil life. Artists and technicians who are normally unobtainable for the Army have been made available to us, and we are now enjoying their benefit.

The school is kept up-to-the-minute in thought and doctrine; in fact we try to forecast the thought and doctrine of the future and be beforehand wherever possible. We have the benefit of all the latest thought from all our commanders and observers throughout the world; and we have been fortunate enough to be permitted to send our instructors in groups to observe the active theaters and other centers of activity, all of which has resulted in keeping us thoroughly up to date. The result of it all has been that the school is still on its high level, with high standards and hard work but good results.

## Three Kinds of Men

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Spanish article in *Ejercito* (Cuba) January-February 1943.]

### 1. THE ONE WHO IS NOT ABLE

THIS is the man who fulfils his obligations poorly. He makes mistakes and forgets things easily. He blames others for everything that happens to him. He is like a lame man who stumbles as he walks. He understands everything poorly, especially his own lack capacity. With his blunders, his mistakes, and his carelessness, he causes an enormous amount of displeasure and disturbance. Of men such as this there is the greatest abundance.

### 2. THE ONE WHO IS ABLE

This is the man who fulfils his obligations. He is "the right man in the right place." He is punctual, obedient, careful. He is the man for whom people everywhere are looking. He is the strong cornerstone of great organizations. Nevertheless—

You can't ask him to do any more than he does. There is no use expecting anything unusual of him. There is no use

counting on him in any exceptional situation. All that can be expected of him is that he will bear the burden of his task without becoming fatigued. Men of this kind are not easily found.

### 3. THE ONE WHO IS MORE THAN ABLE

This is the man who not only fulfils his obligations but who also makes others perform their tasks. He is the man who possesses the qualities of leadership. Instead of limiting himself to following the course of the routine daily task, he is always disposed to strike out over new ways. He is always short of time. He always feels that he has not done much. He normally travels on the run. The world owes its progress to the tireless work of these fighters who are full of optimism and vision. Men such as these are scarce everywhere for they are like the April rains and the May sunshine—wherever they are found they arouse everything to life about them.



# Preparation for a Mission by Heavy Bombardment

*Following is a chronological arrangement of what may take place within a group, after the receipt of instructions requiring air attack. Procedure will vary widely between theaters and is also dependent on the type of equipment being employed as well as the state of training of the crews.—EDITOR.*

I. Upon receipt of the warning order for an operational mission, the following procedure will be followed:

1. The Operations Officer will notify and call a preliminary conference of the following personnel:
  - a. Commanding Officer.
  - b. Flight Commander concerned.
  - c. Ordnance Officer.
  - d. Armament Officer.
  - e. Engineering Officer.
  - f. S-2 Officer.
  - g. Signals Officer.
  - h. Weather Officer.
  - i. Group Navigators.
  - j. Group Bombardiers.
2. The following information will be issued these personnel and the following decisions made by them:
  - a. Flight Commanders.
    - (1) Number of ships called for.
    - (2) Assignment of crews to their ships.
    - (3) Type of formation to be flown.
    - (4) Leaders and deputy leaders in formation.
  - b. Ordnance and Armament Officers.
    - (1) Assignment of ships.
    - (2) Specified leading of ships.
    - (3) Estimated time element for leading.
  - c. Engineering Officer.
    - (1) Assignment of ships.
    - (2) Coordination with Ordnance and Armament Officers in leading.
  - d. S-2 Officers.
    - (1) Number of ships.
    - (2) Estimated time element.
  - e. Signals Officer.
    - (1) Ship assignments.
  - f. Weather Officers.
    - (1) Estimated time element.
    - (2) Keep Operations informed of general weather.
  - g. Group Navigators and Bombardiers.
    - (1) Advise as to who lead Navigator and Bombardier will be, so they may be alerted as soon as possible. Group

Bombardiers coordinate with ordnance and armament.

- h. Upon conclusion of this first preliminary meeting, flight commanders must alert the crews which have been chosen for the mission.

II. Upon receipt of the Combat Attack Order itself, the following procedure will be carried out:

1. The Operations Officer will call a meeting of all officer personnel previously mentioned in the preliminary conference. At this time all factors pertaining to the mission will be made known to respective section heads.
  - a. Navigators work out flight plan.
  - b. Flight Commanders decide latest time to be at ships by crew members, and also taxi time.
  - c. Group Bombardiers work up special briefing rest of flight Bombardiers.
  - d. Ordnance and Armament Officers are notified as to the latest time all bombs must be loaded.
  - e. Engineering Officer is notified that mission is verified.
  - f. Signals Officer is notified of the communications section of the Combat Order. Also, the area where target is located.
  - g. A time is set for the formal briefing. This time should be set for at least two hours before taxi time.
  - h. The Pilots, Navigators, and Bombardiers will be told when to report for their formal briefing. At the same time the radio operators will be told when to report to *Signals Office* for briefing. The remainder of the crew will be notified as to when to make themselves available at the Combat Crew Ready Room. The Co-Pilots will be in charge of this portion of the crew.

III. The following procedure will govern the formal briefing:

1. All Bombardiers and Navigators of the mission will be briefed first. At this briefing the Operations Officer, S-2 Officer, Weather Officer, and Group Navigators and Bombardiers will be present. The following will take place:
  - a. Target maps distributed to Bombardiers.
  - b. Combat Order will be read by Operations Officer.
  - c. Weather report in full will be given by Weather Officer.
  - d. Navigators' flight plan read by Group Navigation Officer.

## PREPARATION FOR A MISSION BY HEAVY BOMBARDMENT

- e. Target map will be blown up by Epedioscope and facts presented by S-2 Officer and details of approach and bombing run will be furnished by Group Bombardiering Officer.
- f. Upon completion of this portion of briefing, the Bombardier and Navigator of each ship will get together for a few minutes private discussion as to team work, etc., required on mission.

IV. Upon completion of first briefing of Bombardiers and Navigators, the Pilots will assemble in the briefing room with Bombardiers and Navigators. Following procedure will govern:

1. Operations Officer reads the Combat Attack Order. Also, he highlights the weather.
2. Flight Commander in charge gives brief details of type of formation to be flown and any necessary emergency tactics. A deputy leader will be appointed. Taxi out, take-off, and landing procedure will be given. Latest time for different crew members to be at ships will be established. Definite time set to start engines. Time tick is given.
3. S-2 Officer will accomplish the following:
  - a. Trip in.
    - (1) Enemy aircraft bases—map.
    - (2) Enemy flak—local map.
  - b. Target.
    - (1) Read description.

(2) Blow up:

- (a) Map.
- (b) Photo.

4. P. W. When necessary.
  - a. Destroy plane and bombsight.
  - b. Special instructions in case of forced landings, etc.
  - c. Say only *name, rank, and serial number*.
5. *Empty all pockets before take-off and hand the contents to S-2 Officer.*
6. *Observations include Time, Place, and Altitude.*
7. Be on the alert and watch for:
  - a. Enemy aircraft: type, color, and tactics.
  - b. Any combat including planes shot down nearby.
  - c. Escort—was it there?
  - d. Shipping, if any.
  - e. Train activity, including directions.
  - f. Airdrome activity.

V. Upon completion of the formal briefing, everyone except the Pilots will report to the combat ready building or the airplane, depending on decision of Operations Officer and flight leader. The Pilots will remain in briefing room till all last-minute changes in take-off time have been received from Bomber Command. Flight Leader only will release them.

VI. When released, Pilots pick up Escape Kits and S-2 Recognition Signals and go to planes.

---

## Always Keep Saying the Same Thing!

---

In so far as explanations are made, the BASIC PRINCIPLES OF TRAINING must be taught ALWAYS IN THE SAME WORDS as set phrases. Only when the more gifted recruits are "fed up" with these basic principles (the same "old baloney" and "old saws"), only when some of these "old saws" crop up in drinking parties of the company, is it certain that the mass of recruits is slowly beginning actually to grasp these principles and assimilate them.

Thus, for example, it cannot be too often said that the soldier must move through the terrain "like flowing water," or that "spade work spares blood," or that "reconnaissance and security" must always be kept in mind.—From "Training Methods," an article in the German military magazine *Die Panzertruppe*.

# Trains of the Armored Division

MAJOR WARNER V. MADDOX, *Infantry*  
Instructor, Command and General Staff School

THE TRAINS of the division are often neglected because of concentration on purely tactical matters. The protection and movement of trains is a tactical function and must be considered as such in combat. Never should the efficient operation of trains be taken for granted; the train commander may have many and varied difficulties to overcome before reaching his objective. The supply trains of the division are a means of effecting supply, maintenance, and evacuation in battle, and only by

*Unit trains* are those vehicles which are an organic part of each unit and appear as such in the table of organization. Unit trains resupply the companies, separate battalions, and regiments of the division by means of the basic loads carried in their organic transportation. The unit trains used primarily for supply, evacuation, and maintenance are further subdivided into two groups, commonly referred to as Echelon "A" or "combat trains" and Echelon "B" or "field trains."

The "A" trains consist of company maintenance, essential fuel and lubricant trucks, ammunition vehicles, unit medical detachments, and unit maintenance. The "A" trains march at the rear of their units in combat giving close support in the resupply of fuel, lubricants, ammunition, evacuation, and maintenance.

The echelon "B" trains include those unit vehicles which are not essential to immediate combat. They are: kitchen trucks, ration trucks, some fuel and lubricant vehicles, company combat equipment trucks, and unit supply and administrative sections.

These vehicles normally march with the higher unit or division trains during combat.

*Division trains.*—The armored division trains are commonly called service trains because they contain the service elements of the division, namely, the divisional maintenance, supply, and medical battalions. The term "division trains" applies to these units plus units attached to division trains, such as division rear echelon and service company, the engineer bridge company, and unit "B" trains.

The division train commander and his staff are found in the trains headquarters. The train commander who is a colonel has as assistants an executive officer, two column commanders, intelligence officer, assistant operations officer, liaison officer, and enlisted assistants. The headquarters company is composed of a company headquarters which contains the housekeeping section of the trains.

*Communications platoon.*—This platoon provides radio and motorcycle messengers for communication between the train commander and division headquarters, between the train commander and the two column commanders, and between the two column commanders and their respective groups.

*Reconnaissance platoon.*—There are two reconnaissance squads which furnish information as to routes, bivouac sites, terrain features, and early warning of the enemy. It is often necessary to increase the size of the reconnaissance platoon by the addition of other personnel.

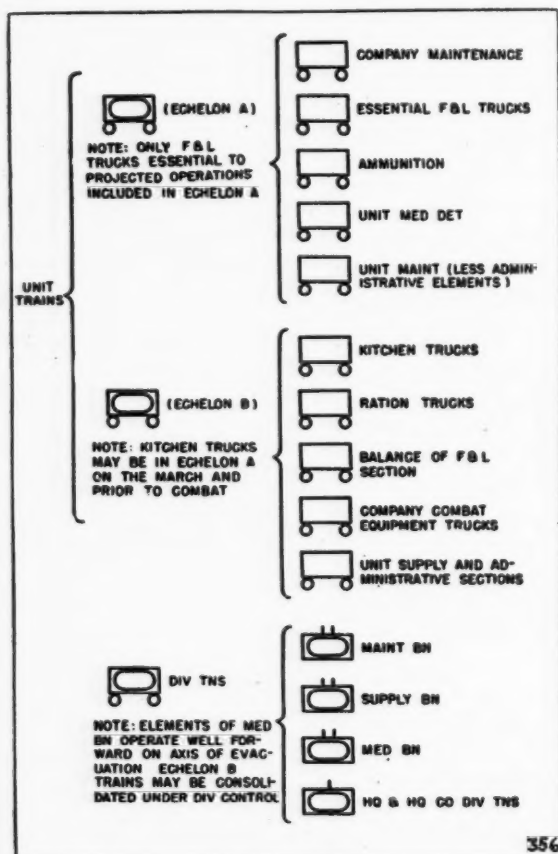


FIGURE 1.  
NORMAL TRAIN ORGANIZATION, ARMORED DIVISION.

their successful operation can the armored division hope to attain success. We must not forget that logistical means make possible tactical success.

In order that we may have a better understanding of the trains in the division and their importance let us discuss their function.

There are two classes of trains in the armored division—namely *unit* and *division trains* (see Figure 1).



## TRAINS OF THE ARMORED DIVISION

**Tank command headquarters.**—This command is provided for the tactical control of any tanks which may be in the trains. It functions directly under the train commander who employs any attached tanks for train defense.

**Division maintenance battalion.**—The mission of the armored maintenance battalion is to maintain the arms and vehicles of the division in a state of

beyond the repair capabilities of these maintenance units are evacuated by army to appropriate echelons of repair.

A well-organized system of maintenance is essential to the successful operation of the armored division. Maintenance is not the responsibility of any single individual; it is achieved through the combined efforts of all echelons from each unit, through the chain of established maintenance facilities. The driver of the vehicle is the first link in the chain. Each tank company has half-track maintenance vehicles which carry maintenance crews, repair tools, spare parts, and a limited amount of gas, oil, and grease for emergencies. Company maintenance vehicles always remain with their companies except during actual combat when they operate from the unit service park and follow their company as closely as possible without getting involved in the fight. They repair vehicular casualties and spot and report locations of crippled vehicles to crews of the regimental maintenance when the necessary repairs are beyond the capabilities of the company maintenance crew.

Regimental crews are equipped with transportation, tools, and a limited supply of spare parts for the supported vehicles. These crews follow in rear of the supported unit and provide maintenance. In combat they operate with the "A" trains from the unit service park, follow company maintenance vehicles, make such repairs as can be promptly made and report disabled vehicles beyond their repair capabilities to the *liaison detachments of the division maintenance battalion*.

**Division maintenance units.**—During combat the maintenance unit, less liaison detachments, remains in its bivouac in the division train area. Contact is maintained with the combat echelon through *liaison detachments*. A typical liaison detachment consists of several motorcycle scouts, several 1/4-ton trucks, emergency repair vehicles, and heavy wreckers. These detachments make quick roadside repairs, clear disabled vehicles from roads, and may evacuate disabled vehicles. They are the first line of maintenance support behind battalion or regimental maintenance troops. Vehicular casualties beyond the repair capabilities of the liaison detachments are reported to the division maintenance units in the division train area. When the situation permits, heavy equipment required to recover the vehicular casualties is dispatched and the vehicle is moved to repair shops. A disabled vehicle may be destroyed or captured by the enemy, and failure to protect and recover these vehicles may result in great losses.

The divisional maintenance battalion should maintain liaison with the following:

1. Supported units.
2. Signal company.
3. Ammunition section supply unit.
4. Division medical units.

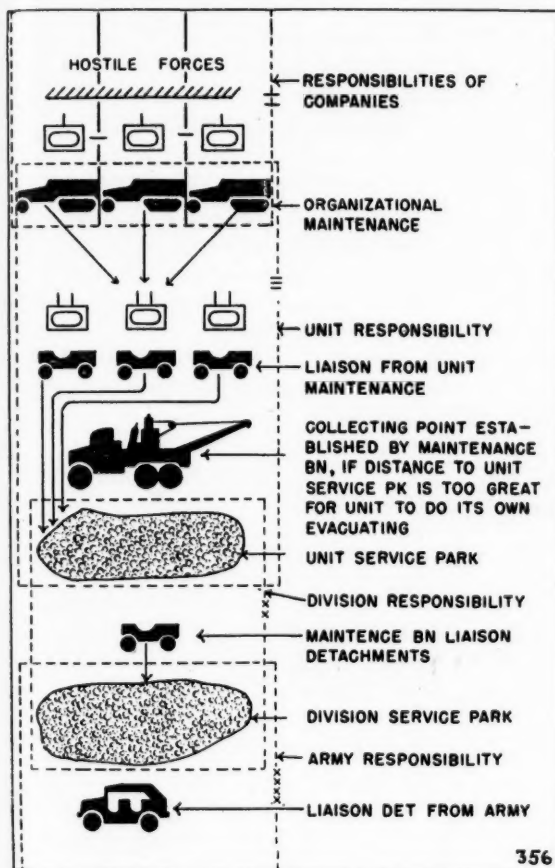


FIGURE 2.  
EVACUATION OF VEHICULAR CASUALTIES.

readiness for battle and to replenish and repair this equipment during and immediately following combat. The battalion also evacuates vehicular casualties and captured material (see Figure 2).

Maintenance troops must be trained both technically and tactically so that they will be able to perform their role in battle.

The headquarters company of the maintenance battalion handles the administration and most of the supply functions of the unit, while the maintenance companies repair and maintain all division vehicles which are beyond the repair capabilities of the unit maintenance crews. Maintenance companies of the battalion normally support each combat command. In addition to the repair of vehicles, facilities are included for the repair of small arms, instruments, artillery, and armor. Vehicles and equipment damaged

5. Corps and army for supplies and 4th echelon maintenance.

6. Chemical company if gas is being used.

The commander of the division maintenance battalion is responsible for the security of the unit, and must make plans in detail which support the general plan for the defense of the division trains as a whole.

The division ordnance officer is a special staff officer. He also commands the division maintenance battalion. The division ordnance officer keeps himself informed regarding the plans of the division commander. His recommendations to the commander regarding the disposition of the maintenance units cover routes of advance, maintenance phase lines, zones or area of evacuation, and maintenance and assignment of maintenance units to support designated combat units. These recommendations when approved by the division commander are published in division orders. The division ordnance officer is responsible for taking the necessary action to insure proper execution of the approved maintenance plan.

Maintenance in an armored division must be timely and adequate; it is a continuous process requiring the unified effort of each member of the command. Tactical success of the armored division depends largely upon the prompt recovery and repair of vehicles in combat.

*Division supply battalion.*—Service platoon.—This platoon provides the labor to the division quartermaster for division ration and supply break-down, and the labor for handling the ammunition load of the supply battalion and its distribution within the division.

*Quartermaster platoon.*—Is organized into four sections: subsistence, transportation, fuel and lubricants, and supply sections.

*Division ammunition section.*—Operates the division ammunition control point under the direct control of the division ordnance officer.

Loads of the supply battalion are prescribed by the division commander. The principal use of these trucks is to deliver ammunition to the unit trains, combat vehicles, or designated dumps, and to replenish the load from ammunition supply points. There will be occasions when this unit will dump the ammunition load and transport other supplies—this, however, is a command decision. The normal employment of the supply unit will be in convoy, varying in size depending on the supply mission. It is essential, however, that all personnel be trained in reconnaissance, orientation, map reading, and night driving. Dispersion of vehicles necessitated by the threat of enemy aerial attack and driving blackout will often cause vehicles to be separated from the convoy; therefore, under such conditions, energetic control by the column commander and a high degree of march discipline are necessary to insure the delivery of supplies.

The protection of the supply unit when operating away from the immediate control and support of the division trains is provided with its organic personnel and weapons plus any additional security needed by the attachment of combat elements. The organic weapons will *not* furnish sufficient protection against enemy air or mechanized attack. The supply unit fights only to accomplish its mission, but this must be expected in modern war and the personnel must be thoroughly trained in defensive and offensive action to be able to accomplish the delivery of supplies.

The armored division quartermaster is responsible for the procurement and distribution of the following supplies: ration, fuel and lubricants, quartermaster equipment, clothing, and special quartermaster equipment. The division quartermaster does not command the supply unit; however, he works closely with the commander of the unit and helps formulate the supply plans. The division quartermaster is a special staff officer and adviser to the division commander on quartermaster problems.

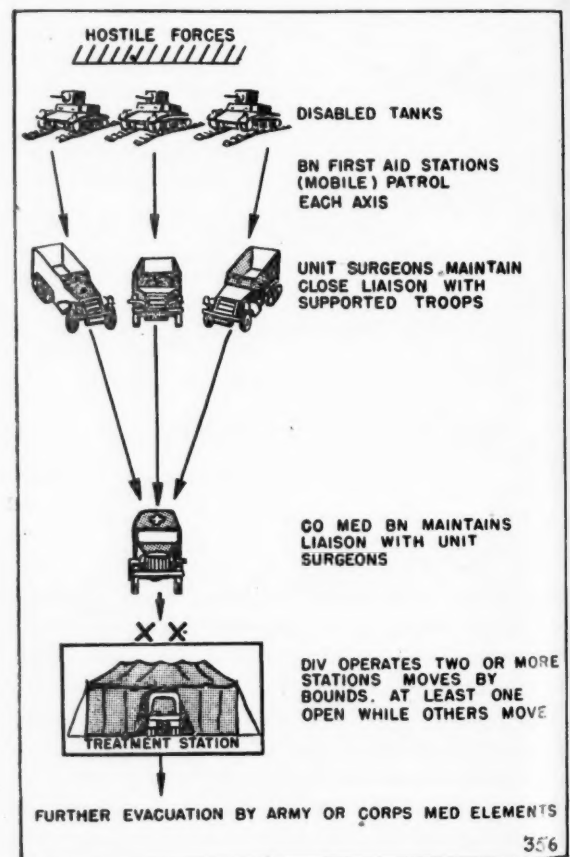


FIGURE 3.  
EVACUATION OF PERSONNEL CASUALTIES.

*Armored medical battalion.*—Unit and separate battalion medical detachments are organized into sections appropriate to the size of the unit supported, and are equipped with cross-country ambulances or half-tracks and 1/4-ton trucks with fittings for litters.

## TRAINS OF THE ARMORED DIVISION

The normal procedure for handling casualties within the armored division is outlined as follows (see Figure 3):

1. Axis of evacuation is announced in division order.

2. Units establish mobile aid stations; patrol each axis; collect, treat, and evacuate casualties to established collecting points on axis of evacuation. Unit surgeons maintain close liaison with supporting medical elements.

3. The division medical unit supports each major combat element of the division with balanced ambulance and litter elements. These elements travel the axis of evacuation and evacuate casualties from unit collecting points to division treatment stations.

4. Treatment stations are mobile clearing stations for the division. Each consists of a platoon headquarters, an operation section, and a casualty treatment section. The treatment platoons in the division are capable of operating a treatment station. One platoon is organized as a gas casualty treatment station—it will function as a normal treatment station if there are no gas casualties. Treatment stations prepare casualties for further evacuation by army medical units. The treatment stations move by bounds, at least one station remaining open while others move.

The *division surgeon* is charged with the procurement and distribution of all medical and dental equipment and supplies in the division. The division surgeon does not command the armored medical unit. However, he works closely with the commander of the medical unit and helps formulate the medical plan and policies. The surgeon is adviser to the commander and staff on all matters pertaining to the health of the command and the care of the sick and wounded. In combat the division surgeon performs a vital service by assuring prompt treatment and rapid evacuation with immediate return to combat of those slightly wounded.

The *division train commander* is responsible to the division commander for the tactical movement and security of the train but not for the supply, evacuation, and maintenance functions of the service elements or attached units.

In making the tactical disposition of trains, the train commander must weigh the logistical functions of the trains with the tactical necessity. The movement of trains is made in compliance with the division administrative order to provide tactical success by use of the supply, maintenance, and evacuation functions.

In combat the train commander has many duties and responsibilities—the tactical command of the trains, their security to the forward point of release, selection of bivouac, reconnaissance of routes to bivouac area; he must keep close liaison with G-2, G-3,

and G-4 with respect to tactical disposition and security of the trains.

It will often be necessary for the division commander to detail combat units to protect the trains. Combat units when so detailed operate directly under the control of the train commander. These attachments may consist of any or all of the following: infantry, tank units, artillery, engineers, tank destroyers, and antiaircraft artillery.

The plans of the train commander must provide for all-around defense of the trains as a whole, including bivouacs, supply points, distributing points, dumps, collecting and clearing stations, and other installations in the rear area for which the division is responsible. His plans further provide for reconnaissance, liaison, and communications. The location of all weapons for train defense must be coordinated by the train commander to provide for all-around defense, with particular attention to likely avenues of approach.

Passive measures of defense against air and ground attack must be utilized to the maximum. These measures include: movement of vehicles off roads when halted, dispersion of vehicles and units, maximum use of cover and concealment, erasure of vehicular tracks leading into the bivouac area, movement at night without lights, and movement by infiltrations during daylight.

The division trains, depending upon the road net and traffic circulation, will march in one or more columns.

Much of the marching will be done at night. The composition of the column will vary, units constantly being attached or detached, and each unit must therefore develop march technique to a high degree of perfection. Columns are divided into march units of 20 to 30 vehicles, unit organization being preserved as much as possible. Columns detail advance, flank, and rear guards.

Traffic control in rear area must be strict when the number of good roads is small. Routes are usually prescribed for the division trains, and these routes must be closely coordinated to prevent interference with supply and evacuation functions. In selecting and designating routes the following must be considered: conditions of road, capacity, strength and clearance of bridges, length of route, security, suitability for night use, and weather.

In preparing for the march adequate plans must be made as follows:

1. Issue warning orders to each unit in division trains.
2. Select routes if not prescribed.
3. Make reconnaissance.
4. Measure distance.
5. Select phase lines.
6. Arrange for guides with provost marshal.



7. Reconnoiter new bivouac area.
8. Assign units to columns and routes.
9. Select initial points and time of departure.
10. Make final plans and issue orders.

The general area for bivouacs is designated by the division commander. The train commander reconnoiters this area and divides it into unit areas for the trains. In the advance the train bivouac will be in rear of the division reserve, a distance of not more than ten miles depending upon the road net and condition of roads. This is necessary for protection and rapid delivery of supplies to the combat units.

In the defense the train bivouac may be 35 miles behind the combat units, depending upon condition of roads.

The following characteristics should be sought in selecting bivouac areas:

1. Concealment from air observation.
2. Space to allow dispersion of vehicles.
3. Obstacles to protect against mechanized attack.
4. Numerous exits—good road net.
5. Hard standing for heavy vehicles.
6. Good field of fire for defense weapons.
7. Allowance for work under blackout conditions.

*Security.*—The division train commander is responsible for the security of the division trains, plus all attached units. Each subordinate unit is responsible for its own local security, but the security of the trains as a whole cannot be delegated to a lower unit.

Any plans for security must be extremely flexible.

Although the trains march behind the combat troops and receive some protection from these troops, each column must provide for front, flank, and rear protection. The train can gain some protection from adjacent troops and by marching on routes away from the exposed flank.

Danger to the column from ground attack may come from small enemy groups infiltrating through our troops and attacking the trains while they are on the march.

The train commander must keep constantly informed of the situation by maintaining contact with the following: the division command post through liaison and radio, the division air reconnaissance, the division provost marshal and the network of traffic control posts, the train reconnaissance platoon, and the column commanders of adjacent columns.

The trains are particularly vulnerable to air attack. Weapons must be prepared at all times for instant use against low-flying aircraft. The dispersion of vehicles, the use of cover and concealment, air warning nets, and the use of slit trenches will assist in providing security against attack.

To control the many vehicles and the personnel of the division trains, an adequate and efficient method of communications must be established—radio must function properly for the timely movement of supplies.

The efficient operation and control of trains is an immense task, and a vitally important one. The train commander should have much experience, ingenuity, initiative, and dependability to be in control of this vitally important part of the division.

---

War, indeed, is destructive in its purpose and wasteful in its results, and therefore as an ideal utterly irrational. War, however, acts as a mental stimulus and draws into its machine large numbers of scientists, inventors, and others who, in normal times, are engaged in peaceful activities. These, with the financial and other assistance which war places at their disposal, produce technical improvements and material output at a pace unknown in peace. The increased tempo of war is of value afterwards, the great advance in mechanical transport both in the air and on land after the last war being a case in point. Furthermore, in spite of the waste in resources which war involves, it does stimulate the desire for, and perhaps even the progress of, social reform. It has been a factor in the great advance of social services of all kinds, with the resulting betterment in the housing, health, and living conditions of the people. But, of course, these results cannot be expected to ensue if war among the great nations becomes endemic.

—Major General G. M. Lindsay

*The War on the Civil and Military Fronts (1942)*

# What's Hard About Map Reading?

MAJOR H. C. EASTMAN, *Corps of Engineers*  
Instructor, Command and General Staff School

**H**ISTORY is full of examples of military operations which failed because of the inability of officers to read a map. It is true that much more difficulty was caused by inaccurate maps and sometimes the lack of any map at all. Today good maps are available and poor ones can be supplemented by aerial photos, but these maps and map substitutes are valueless unless they can be read.

The ability to read a map is one of the basic tools which every soldier must have. It is perhaps understandable that some enlisted men are not very proficient in this respect, but there is no excuse for any officer not being able to read maps and map substitutes at least sufficiently well to know where he is on the map, know where he wants to go on the map, pick out the route he will use, be able to follow that route, and finally, know how far it is to the point in question.

You may say to yourself, "What's hard about that? I can do that much." You are correct. It is not hard, but *can you do it?* At the beginning of each course at the Command and General Staff School there is given to the class an examination in map reading. This examination is not difficult—it is intended merely to check each student's knowledge of elementary map reading. Yet ever since it has been given, well over 33 $\frac{1}{3}$ % of each class fails to pass it. Ninety per cent of those students who failed the course failed in this first examination. In the writer's opinion no officer should be ordered to the Command and General Staff School as a student unless he has demonstrated his ability to read a map. Obviously, this is a prerequisite for duty with troops.

Map reading can be simplified if we constantly keep in mind what a map is and what its characteristics are. A map is a representation of an area of the earth's surface. It is characterized by:

1. The fact that it is drawn to some sort of a scale, so that ground distances can be measured.
2. The inclusion of some sort of a system so that points and areas on the ground can be located. The system might be a military grid system, it might be the inclusion of longitude and latitude lines, or perhaps only a line showing the direction of north.
3. Sometimes the inclusion of some sort of a method to show elevation—such as contours, or hachures combined with spot elevations.
4. The use of conventional signs and symbols to represent the natural and artificial features on the earth's surface.

Therefore, if we know how to use these four char-

acteristics—scale, location, elevation, and conventional signs—we can read a map—any map.

Now when we consider a map substitute, we find that these same four characteristics apply. In some cases not all of them will be on the map substitute we are using, and we will have to get along without them. For all practical purposes the Photo Map is the only map substitute that we use. However, there are different kinds of Photo Maps, but the three kinds we most often encounter are the Controlled Mosaic, the Uncontrolled Mosaic, and the Aerial Photograph. Briefly, the characteristics of these are as follows:

1. The controlled mosaic is an assembly of two or more overlapping vertical photographs which are fitted to a control plot so that all features in the photographs are at the same relative distance from each other as they actually are on the ground. In other words, the controlled mosaic has uniform scale. Ordinarily the corresponding section of the military grid is overprinted on the mosaic. Thus this type of map substitute has a uniform scale and a system for locating points—namely the grid. It is not contoured, however, and the ground features are not represented by conventional signs and symbols but are actually pictures of those features as they look from the air.

2. The uncontrolled mosaic is an assembly of two or more overlapping vertical photographs which are assembled only by the matching of the photographic detail without the benefit of a framework of control points. If the individual photographs were all of the same scale and if there were no tilt or distortion in any photo, this assembly would also be of uniform scale. But actually this never happens, and as a result horizontal distances on the uncontrolled mosaic cannot be accurately measured. Nor can you place the military grid on it. You can, however, put on an arbitrary grid for use in locating points on the mosaic. As far as elevations and conventional signs are concerned, the uncontrolled mosaic is the same as the controlled mosaic.

3. We all know the aerial photograph. A single vertical photograph, rectified for tilt, is of uniform scale for practical purposes, and we can if we desire overprint it with a grid. Ordinarily, however, this is not done because of the time element. So we have in a photograph the characteristic of scale, but no method of locating points. And we have the same characteristics as mosaics with regard to elevations and conventional signs.

In these days we must know how to read foreign

maps as well as our own. Foreign maps have the same characteristics of scale, location, elevation, and conventional signs, but in order to read them we should know in what way these characteristics differ from these same characteristics on our maps. Let us see if there is any great amount of difference.

*Scale.*—Most foreign maps use the metric system in measuring distances and elevations, so we should know the metric system—or at least how to convert it to our system of inches, feet, yards, and miles. Conversion tables are easily available, so it is not necessary to remember any conversion factors. But there is one thing that is common to both foreign maps and our own. That is the method of expressing scale by means of the Representative Fraction. Never forget that the RF is a ratio—that one unit of measurement on the map is equivalent to so many of the same units of measurement on the ground depending upon the scale. So it makes no difference whether we use the metric system, the English system, or any other system. In other words, if we have a Russian map whose RF is 1:100,000 we know that one inch on the map is equal to 100,000 inches on the ground even though the graphic scale on the map is in “*versts*.” That is the beauty of the RF.

*Location.*—Foreign maps use the same methods as do our own in locating points and areas on the ground. Some of them are overprinted with a military grid, some show the lines of longitude and latitude, and occasionally you will encounter a map on which all that is shown is the direction of north. Many of the foreign maps we will use, however, will be over-

printed with the British Grid System, and we should be familiar with this system and how it is used. There has been recently issued a Tentative Technical Manual entitled “Use of Foreign Maps.” This manual explains the British Grid System in detail and is worth studying.

*Elevation.*—You will often have a foreign map upon which elevation is shown by hachures instead of contours. Remember that, unlike contours, hachures only indicate *slopes* and not actual elevations. Actual elevations are indicated by figures scattered over the map which represent spot elevations usually in *meters* above sea level. Hachures confuse many officers because the blank spaces on the map indicate level areas and they don't know whether such a level area is on top of a hill or ridge or in a valley. Hachured maps are worth studying merely to get that picture of elevation in your mind. This study is simplified if one first emphasizes the streams by drawing blue pencil lines along them (in map parlance, “streamling the map”).

*Conventional Signs and Symbols.*—There is no easy way of learning foreign conventional signs and symbols. However, many of them are similar to our own and will aid you in obtaining a fairly clear picture of the terrain even if you are not familiar with the symbols on the map you are studying.

There are several excellent books on the subject of map reading, but any officer who has studied and who understands the information in FM 21-25 “Elementary Map and Aerial Photograph Reading” need have no concern with regard to this vital subject.

---

Unlike Nelson's day, now no valour can compensate for mechanical inferiority.

—Admiral Lord Fisher.

(The military effects of mechanical inferiority were not so recent as Admiral Lord Fisher seemed to think, as witness the following!)

And the Lord was with Judah; and he drove out the inhabitants of the mountain; but he could not drive out the inhabitants of the valley, because they had chariots of iron.

—Judges I, 19.



# The Action at Toropets

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Major Dr. Schäfer in *Deutsche Zeitung in Kroatien* 6 January 1943.]

SINCE the morning of 25 November the Russians had been attacking a great and important army sector ceaselessly and without regard for losses at widely separated strong points. By penetrating and breaking through the German front in several places they planned to gain a victory regardless of consequences and to cause the collapse of dominant key positions in the central sector. In the plans of the enemy the area southeast of Toropets formed an important strong point. Here, on the morning of 25 November, he opened a long and violent bombardment by his heavily massed batteries and guns. Then picked troops attacked with numerous tanks. In spite of determined German resistance—in marshy places the defense action had to be carried on from supporting points which were built above the ground level—and in spite of excellent cooperation by all our arms, the enemy succeeded by his massed attacks in making a breach in the German defense lines. With the intention of developing and exploiting this local success he sent several tank and infantry units through this break, and with them the 1st Motorized and Mechanized Corps which as a result of its equipment and great mobility was expected to attain distant objectives. Combat groups

from this corps had, according to the reports of prisoners, the mission of reaching and blocking a very distant supply route. Various formations of the enemy penetrated both to the north and south, others attacked the protected German flanks and the stubbornly and successfully defended corner pillars of the breakthrough point (Fig. 1).

It was a violent struggle. The Germans not only defended themselves but in several places organized counterattacks. Soon the usual picture resulted. The Soviet soldiers who had broken through were uncer-

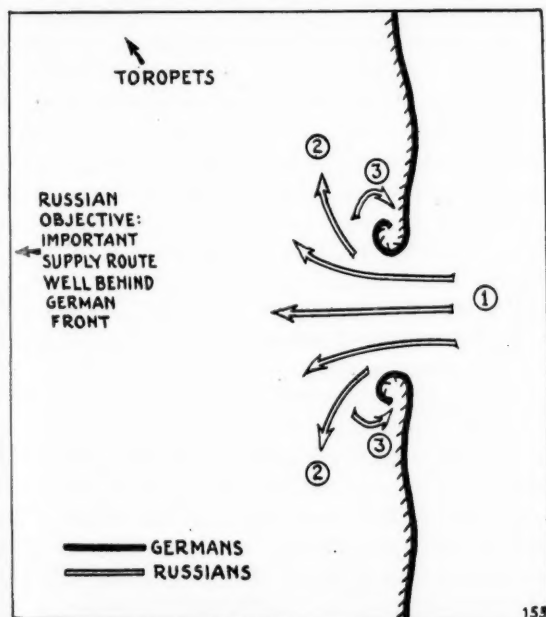


FIGURE 1.

1. Picked Russian infantry with tank units and 1st Motorized and Mechanized Corps break through German lines after violent bombardment by massed artillery on 25 November.
2. Russians drive hard to north and south behind German front.
3. Germans succeed in holding "corner pillars" of breakthrough gap, although heavily attacked in their rear by Russians striving to enlarge the gap.

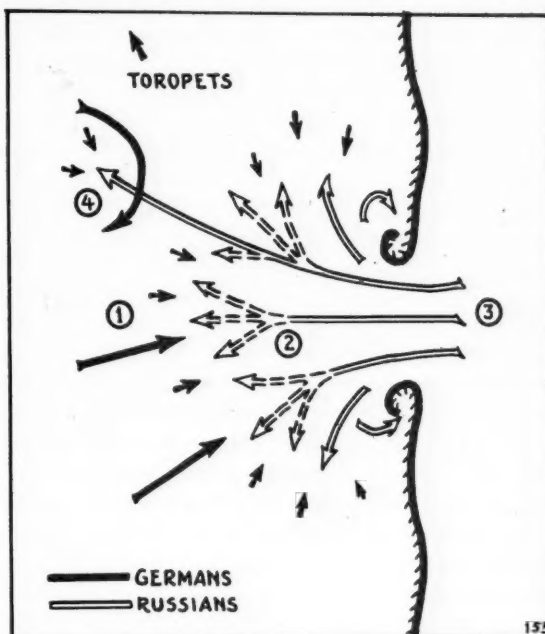


FIGURE 2.

1. Germans quickly organize a "flexible defense" while launching strong counterattacks at various points.
2. Russians within German lines become confused by German "flexible defense" and counterattacks. Soon begin to lose contact with their central command.
3. Delays in bringing up supplies and reinforcements slow down Russian drive.
4. Germans clear Russians off important supply route. A German tank division cuts off and surrounds Russian forces in this area, annihilating a motorized and mechanized brigade.

tain, since there was no single command and the middle and lower commands were not able to handle assignments whose nature was constantly changing due to the flexibility of the German defense. In addition, considerable enemy losses resulted in occasional pauses in the operations, difficulties arose with respect to supplies and reinforcements, and the Soviet infantry when fighting in a fluid situation is hard to move ahead though it does fight hard and stubbornly in defense. Tank and motorized formations were stopped by the German defense and counter-

thrusts, hurled back, or forced into another direction. Thus in one area a German tank division by attacking resolutely and successfully, stopped the assault of the enemy, cleared him off the important supply route, put a group of tanks out of action, surrounded and annihilated a motorized and mechanized brigade, and pursuing without interruption, formed a barrier to the east of the Russian force and so completed the encirclement of the enemy who had broken through in this area (Fig. 2).

The German countermeasures were not only intended to push back the considerable enemy forces which had broken through, but also to cut them off and encircle them. The command was faced with the task of making the assault forces assigned to this task strong enough, and to commit them in the right place at the correct moment with the most perfect cooperation. Considering the difficulties it was not easy to come up to these requirements. The attending success showed that as a result of their experience the command displayed a very skilful hand and that the forces came fully up to the hopes that had been laid on the operations. The tactical assembly of the assault forces took place under the protection of a hastily developed defense front. The attack was carried out in a northerly direction over a terrain that was relatively free of woods and at a moment when the enemy gave evidence of a certain degree of weakness as a result of his losses. In a short time, however, by bringing up all available heavy and effective artillery, there began on 7 December the drive of the 19th Tank Division in the form of a narrow but powerful wedge. The enemy had not calculated on his southern flank's being broken into. He was surprised but defended himself stubbornly. We had to pass up the use of the German air forces on account of the unfavorable weather so that the ground forces were left to their own resources. By the first evening it was already possible to close the break to the extent of two-thirds of its original size. In doing this, important supply routes of the enemy were blocked. The flexible and sure command and, above all, the energy of the troops were responsible for the rapid and successful penetration of the enemy's front and rear lines of communication by the tank division.

The attack went rapidly ahead by stages. All resistance was broken. Special measures had to be taken for the security of the deep flanks of the narrow wedge, for it would certainly be expected that the enemy would quickly attempt to break through the barrier from both sides. For this reason other forces made use of part of the hole, passed through it, wheeled about, and in this way came partly into the rear of the enemy, broadening the wedge which had broken through and by hard fighting protecting the west flank. On the third and fourth days the place where the break had occurred was closed over its whole length, parts of another tank division com-

ing in from the north and participating in the operations (Fig. 3).

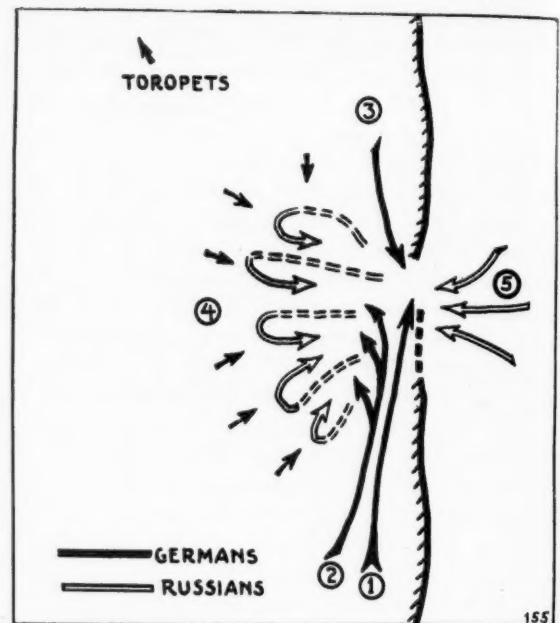


FIGURE 3.

1. Narrow German wedge driven northward by 19th Tank Division on 7 December closes up two-thirds of gap by evening, cutting an important Russian supply route through the gap.
2. Other German forces soon follow along the path of the wedge and wheel out to attack Russians in rear, thus broadening the wedge.
3. Part of a German tank division comes in from the north to complete the closing of the gap on 10 and 11 December.
4. Russians turn and launch attack from west to effect an escape through German forces thrown across the gap. They are repulsed and all are "mopped up" by 16 December.
5. Meanwhile, Russian attempts to effect a rescue require withdrawal of troops from other sectors, preventing execution of operational designs in those areas.

The cutting off of the enemy who had broken through southeast of Toropets, his encirclement, the repulse of his efforts to break through our lines and, in particular, of those efforts made by strong forces to escape by attacking the German barrier from the west, constitute a tactical and, in part, an operational victory of great significance. The formations and staffs which in this sector stopped, repulsed, and hurled back the enemy in his mass attacks, then surrounded and annihilated him and blocked all efforts at rescue, prevented the enemy from carrying out his extensive plans. A large part of the enemy who broke through was annihilated and his valuable equipment either destroyed or captured. On 16 December the wholesale mopping up of the surrounded forces was concluded. The losses of the enemy were so great that his vain attacks for the purpose of liberating the enclosed formations required more forces than he had in reserve for this sector. As a result he was compelled to withdraw forces from some places which, in his major operational plans, also constituted strong points and had other tasks. Stubborn German defense and energetic counterattacks here, as in other places, not only beat the enemy tactically but at the same time interfered with and stopped the execution of his great operational designs in the central sector.

# The Naval War College

LIEUTENANT COLONEL GEORGE F. ASHWORTH, *Infantry*

JOINT operations of the Army and Navy have already assumed an important role in the present war, and it can reasonably be expected that their importance will increase rather than diminish when the Pacific becomes the main theater. The organization of the Joint Chiefs of Staff in Washington is a key to the place given joint operations by the heads of the military and naval establishments. It is, then, particularly appropriate that army officers should attend the Naval War College at this time, although such attendance is not a new thing; and it would be equally valuable to naval officers to have the benefits of the Leavenworth course. Both direct and indirect advantages accrue to officers of one service who study in schools of the other. First, of course, they prepare themselves for joint operations. Second, they gain appreciation of the problems of the other service and are not so likely to expect the impossible. Third, they understand the likenesses and differences of the services. Last but not least, they have the advantage of studying the art of war from another viewpoint, and it is axiomatic that this study cannot be made from too many viewpoints or made too often. To mention only a few in which army and navy problems differ, it may be said that the extreme mobility of a fleet as compared to a land force, its relatively simple logistical problems, its virtual freedom from terrain and route of movement problems, and the fact that a fleet is divided into relatively largely indivisible units (the ships themselves) all influence the conduct of operations and make naval solutions to given situations far different from army solutions to comparable situations. Staff work in the navy is much simpler and the exercise of command in a moving situation more direct. But the underlying principles of war apply to sea as well as land warfare, and an army officer at the Naval War College will not find himself as much at sea as he might expect. He will enjoy his contact with officers of the sister service and will learn a great deal in the local sessions of the universal seminar—the "bull session." He will find that his maritime brothers in arms are good hosts.

The Naval War College consists of the academic building only. No quarters or other facilities are provided for officers who attend, and they usually find themselves quarters in Newport. The War College is located on Coasters Harbor Island which is connected to Newport on the Island of Rhode Island by a causeway. A naval training station occupies most of the island, the War College being sited on the south end overlooking Narragansett Bay to the south

and west. The main building is Luce Hall, named for the first President of the War College, and two newer wings are Mahan and Pringle Halls. The building is built of local granite and is well suited to its purpose. It is well situated and quite handsome. Offices for the staff and the students occupy most of Luce Hall and part of Pringle Hall. Each two students have an office with desks, typewriters, a drafting table, bookshelves, and various reference books and charts. An auditorium where all classes are held is also in Pringle Hall, and above it is the maneuver board. This consists of a large room which can be divided by curtains into smaller compartments screened from each other. The floor is divided into squares of different colors, and these squares are each divided into one hundred smaller squares alternately dark and light. Model ships are maneuvered on this board, the squares facilitating measurements and relative positions. One of the small six-inch squares usually represents a thousand yards, so that the room, which is about sixty by ninety feet, can accommodate quite a bit of ship movement. A balcony around the room permits viewing the whole board from above, and operators can go out on it to move ships or study their positions in detail. A pneumatic tube system connects this room with the student offices, and problems are worked out by sending messages through these tubes until ships are nearly in sight contact (or would be at sea) when the students assemble in the maneuver room and continue the problem by actually moving the ship models on the board. Elaborate maneuver rules based on latest data and fleet practice have been prepared for conducting these board maneuvers, and every effort is made to achieve realism. Ship handling, gunfire, effect of fire, weather, position of sun, condition of sea, etc., are meticulously simulated. While the room containing the maneuver board is the most distinctive physical feature of the War College, its other facilities are equally adequate. Some have already been mentioned but one which has not is the fine library housed in Mahan Hall. This library, named for America's most famous military writer, is well stocked with reference books related to the purposes of the War College. Mahan did much of his work while on the staff of the War College, which was opened in 1884 and occupied at that time the building which had been the local poor house. Luce Hall was built in 1892 and Pringle and Mahan Halls later.

The student officers at the War College are divided into two classes, the Command Class and the Preparatory Staff Class. Army officers are assigned to the



Command Class and each ordinarily shares an office with an officer of the regular Navy or Marine Corps. The Preparatory Staff class is composed of Naval Reserve and Marine Corps Reserve officers. Many of the Naval Reserve officers had no military training prior to the war, and the program of the Preparatory Staff Class is devoted more to fundamentals than that of the Command Class. As all army officers are in the latter class, discussion will hereafter be limited to it, though the two classes work together in many of the problems and receive much of their instruction in common.

The course begins with presentations by members of the staff which are designed to familiarize the students with the characteristics, capabilities, and limitations of naval ships of the various types and of their weapons. Discussions of naval strategy and tactics follow. One army instructor is assigned to the War College staff, and during this orientation period he gives a lecture on military organization and strategy. All presentations by the staff are read in the auditorium and illustrated by slides thrown on the screen. Occasionally a training film is shown.

The first practical work done by the students consists of planning searches. These may be conducted, depending upon conditions of the problem and forces available, by light forces, ship-based aircraft, or patrol planes. There are many accepted ways of making searches with these various types of ships and planes, and the laying out of an adequate search plan is quite an undertaking. It necessitates a plan which will cover the area to be searched, leaving no gaps and taking into consideration the speed of the ships (or launching the planes) making the search, the enemy, the visibility conditions, etc. Computations of time, distance, fuel, direction of out and in passage, and allowances for periods of darkness are all complicating factors.

The next practical work is a study of relative movement problems of all sorts. For example, when a ship in a formation is ordered to change its position in the formation which it is under way, the course it must take and the speed it must make good are entirely different from what would be true if the formation were hove to; and the time it will arrive at its new position requires careful calculation. Another common use of relative movement technique is the computation of data required for the effective firing of torpedoes from moving ships against moving targets. The first ships, target ships, and torpedoes will ordinarily all have different speeds and courses and the fire to be effective must be figured with particular care because of the slow speed of torpedoes in comparison to other projectiles.

In addition to those previously mentioned, there are presentations on a number of subjects of a special nature. One concerns the organization, use, and effectiveness of escorts for convoys. Another comprises a discussion of the organization and function of Sea

Frontiers which are the naval defense zones corresponding to the Defense Commands on land.

One of the most important and interesting presentations concerns amphibious warfare. It is made by the Marine Corps member of the staff assisted by the army member and includes theory, practice, historical illustration, equipment, and naval support. A knowledge of the effect of supporting fire from naval guns is particularly valuable to army officers who may have occasion to depend upon it in planning landing operations. If special ammunition is used, these guns, many of which are much larger than army artillery, are able to cover a much larger area per gun and with the additional effect of more shock apart from actual hits. All types of landing craft for both men and matériel are described.

Almost every Saturday a presentation on the status of the war is made by the officer in charge of the War College Archives where all intelligence is received from outside agencies and collated. The two chief sources of information are the Military Intelligence Service and the Office of Naval Intelligence.

From time to time outside lecturers are brought in to discuss subjects in the fields of history, economics, geography, political science, psychology, etc., related to the work of the War College. One of these discussions, that of international relations, inaugurates a period of study by the students. Naval officers are frequently confronted with problems involving international law or international relations, and an effort is made at least to familiarize them with the nature of such problems while at the War College. After an introductory lecture, the student officers devote a number of days to the solving of twenty situations involving international law, using a large number of reference books available at the War College in arriving at their solutions. The outside lecturer then returns and two days are given to presentation of solutions by individual students and criticisms of these solutions by the lecturer.

The main body of the War College course consists of the solution by the students of operations problems. Solutions comprise three phases; and any one, two, or all three phases may be worked out for any given problem. The first phase is a written solution which culminates in an operation plan or a directive. The second phase consists of out-of-sight contact maneuvering conducted by the students from their rooms, and the third phase is the maneuvering on the board through the use of ship models. In the latter two phases the students are assigned to staff and command positions in one of the opposing fleets or to some sort of umpiring. The motives of the operations problems are to give practice in the solution of such problems, to give practice in the writing of directives, to promote familiarity with strategic naval areas throughout the world. Before the solution of each problem is begun a presentation on the strategic area concerned is made by a member of the staff. Oper-

ations problems of both a strategical and of a tactical nature are involved. The length of time allotted to problems varies. In a so-called Quick Decision problem much or all of the written work is eliminated; the students are presented with a situation; and a quick decision, which will be tested on the maneuver board, is expected.

In the belief that "the employment of a uniform mental process by all echelons of the chain of command," to quote the prospectus, is desirable, the War College has adopted a book to serve as a guide in the preparation of solutions to operations problems entitled *Sound Military Decision* or, more familiarly, SMD. After a recondite discussion of war in general and of mental processes employed by commanders in solving problems which arise in waging war in particular, SMD arrives at a systematic mental process for solving military problems. This process may be reduced to writing which is done in solving problems at the War College. In outline, it consists of four steps, the estimate of the situation, the resolution of the required action into detailed operations, the preparation of directives, and the supervision of the planned action. The first step begins with the establishment of the basis for solution of the problem by considering first the appropriate effect desired, broken down into a summary of the situation, a recognition of the incentive, an appreciation of the assigned objective, and resulting in a formulation of the mission. Secondly, relative fighting strength is considered. This includes a survey of the means available and opposed, broken down into general factors (political, economic, psychological, information, and counter-information), and factors more directly applicable to the armed forces (vessels, including aircraft; land forces, including land-based aviation; personnel; material; and logistics) and a survey of the characteristics of the theater of operations, including hydrography, topography, weather, daylight and dark periods, relative location and distance, lines of transportation and supply, facilities and fortifications, and communications. The last point under relative fighting strength is the conclusion. Next, suitable, feasible, and acceptable courses of action are determined by an analysis of the assigned objective; a survey of courses of action; the application of tests for suitability, feasibility, and acceptability as to costs; and the listing of retained courses of action. An examination into the capabilities of the enemy is made by a survey of the enemy's problem (including a summary of the enemy's situation and an analysis of the effect desired by the enemy); a survey of the enemy's capabilities; the application of tests for suitability, feasibility, and acceptability;

and the listing of retained enemy courses of action. Selection of the best course of action is next made by an analysis and comparison of the retained courses of action which results in the determination of the best course of action. The end result of this first step is the decision. The second step first considers assumptions, then alternative plans, if any, and then applies the essential elements of a favorable military operation by considering correct physical objectives (and effective action with relation thereto), advantageous relative positions, freedom of action, and proper apportionment of fighting strength. Operations are then tested for suitability, feasibility, and acceptability, and those retained are listed. Tasks are then formulated and tested for suitability, and acceptability, after which task forces and task groups are organized by grouping tasks, assigning the necessary strength to carry them out, and then combining these two factors. Finally, the "fundamental military principle" is applied to the determination of objectives embodied in the tasks; measures to insure freedom of action are assembled; information to go in the directive is compiled; and if no subsidiary plans are necessary the student is ready to write the directive, which is the third step. The directive corresponds to an army field order, though following a somewhat different form. The fourth step, supervision of the planned action, is taken by the student in carrying out his maneuver assignment. Much of the terminology in the lengthy outline given above may not be clear, but it is given to enable one who has not attended the War College to visualize the process the student officers follow in solving operations problems in writing, as this constitutes the bulk of the work of the course.

Each problem, solved in writing by the student, is criticised in writing by the staff, and each maneuver is followed by a critique not dissimilar to an army critique.

Prescribed reading is announced on each monthly schedule. Each student officer submits a thesis on a prescribed topic which is criticised and returned to him. All necessary material for the thesis and the prescribed reading is available in the library.

Upon completing the course at the Naval War College, an army officer will have more knowledge of war in general, naval war in particular, and the conduct of joint operations. He will also have a finer appreciation of his own service—the United States Army.

---

NOTE: This article may not be reprinted in whole or in part without the express, written permission of The President, Naval War College, Newport, R. I.

# Interior Lines in Tunisia

[From *The Fighting Forces* (Great Britain) June 1943.]

**I**N *The Fighting Forces* of April, 1942, the conditions favorable for the successful use of interior lines were laid down and the following general verdict given: "A campaign fought purely on interior lines, though giving scope for brilliant feats of strategy, never leads to decisive results unless the enemy's retreat is cut off by the sea or some other impassable obstacle." It was this general aspect of the matter that enabled us to view with complacency the setbacks we have met with in the Tunisian campaign. For Rommel and Arnim have been fighting against opponents who had—to use a simile from the ring—no ropes behind them.

But there are other factors, besides the presence or absence of ropes, that lead to the successful use of interior lines. They are tabulated in the above mentioned article as follows:

You must keep your opponents separated.

You must deal with your immediate opponent so drastically that he will not be able to turn and strike you in the back when you are tackling enemy number two.

You must have time and space to maneuver.

*Per contra*, if your opponents are to achieve a decision by their use of exterior lines they should possess:

Superior numbers.

Good communications.

Resolute and bold subordinate commanders.

Finally, the commander in chief must be able to mount a fairly continuous attack with all his columns simultaneously.

Let us see how these factors worked out in the Tunisian campaign.

1. *El Kasserine*.—The first blow was struck by Rommel at El Kasserine, and appeared to be completely successful. But Rommel voluntarily retired from the "bulge" he had made. Why? Because he correctly appraised the fact that Anderson had no "ropes" behind him, and that the farther and deeper he extended the "bulge" the more precarious would become his own position. Moreover, he could not be in two places at once and his real object in attacking the Americans was to keep them at arm's length while he turned on the Eighth Army.

2. *Mareth Line, Phase I*.—Rommel attacks the Eighth Army. We learn from a captured order that Rommel regarded this attack as the decisive battle of the campaign, for unless he could drive Montgomery right back the Allies would eventually close in on him. It was indeed decisive in one way—decisive for his own army, but not in the other way—for the Eighth Army; for the Eighth Army could retreat two thousand miles before it reached its "ropes": in fact, there were no "ropes."

Nevertheless, the above two operations show Rommel at his best; his was the sort of maneuver at which Napoleon was an adept. He had "time and space to maneuver," and he made good use of them. But he did not (because he could not) "deal with his first opponent so drastically as to prevent his return as soon as his back was turned."

3. *Mareth Line, Phase II*.—Montgomery made use of a virtue inherent in exterior lines, namely, that he was able to threaten the communications of his opponent without to the same degree exposing his own. Moreover, the very fact that Rommel had two "ropes" behind him—the sea and the salt lake—with only a narrow gap between them made him peculiarly sensitive to such a threat, and induced him to start his withdrawal before even his Italian colleague wished.

4. *Gabes Gap*.—Here Rommel tried once more the Napoleonic maneuver, throwing his panzers against the Americans. Excellent in theory, if only he had had "time and space to maneuver." But he had neither. Consequently when Montgomery struck, the panzers could not get back in time. This is another way of saying that the Eighth Army had now joined up with the 18th Army Group.

This brought in its train another factor—"good communications." The next factor—"resolute and bold subordinate commanders"—the Allies already had. There remained but one factor in order to ensure success—"a continuous attack by all the columns simultaneously." The word "simultaneously" must not be taken too literally; the attacks must be so closely spaced that the enemy has no opportunity to transfer troops from one quiet point to the threatened point in time. This situation or condition of affairs now obtained.

5. *The Final Battle*.—The final operations of all the armies must be looked upon as *one* operation. Though the pressure and the tempo varied from place to place and time to time, that is the nature of all battles. The essential point is that *simultaneous pressure* was being applied all along the line, all the time. This being so, Arnim could extract no advantage from his central position; he appears to have tried, but it helped to lead to his downfall; for he transferred troops from the American sector to the south when there was no longer time or space for the purpose. For Alexander was now utilizing to the full his "superior numbers" (a term which covers superior arms and air armada). All the factors for the decisive success of exterior lines were present, and the inevitable result ensued.



# Operations of an Induction Station and Reception Center

LIEUTENANT COLONEL CHARLES L. MALONE  
Commanding Fort Leavenworth Reception Center No. 1773

**S**EVENTEEN months of wartime induction experience, putting into practical application the plans formulated by U. S. Army officials nearly a quarter of a century ago for full utilization of manpower, are beginning to reflect returns of a revolutionary character on the battlefield. Landing operations on the North African coast and subsequent troop movements preparatory to Rommel's Afrika Korps' exodus from Tunisia and the African continent clearly demonstrate that "matching the man to the job" is essential in successful high-speed, mechanized warfare of World War II.

Few people, as they read in the newspapers or hear by radio the latest bulletins from the spreading war-fronts, are aware of the vital roles played by the various armed forces induction stations and reception centers located throughout the United States. These induction stations and reception centers are making it possible for military officials who plan this nation's battle strategy to have available the "right man for the right job" in sufficient and uninterrupted numbers to assure ultimate victory.

The Fort Leavenworth Armed Forces Induction Station and Reception Center, as one of a number of these important induction points, is geared through skilful use of trained army personnel to give personal attention to a maximum of 1,000 inductees daily.

Daily, inductees arrive at Fort Leavenworth. And daily, others who have completed the induction process depart for replacement training centers, for new divisions, or for limited service units for replacement of general service men. With each recruit goes his own "Soldier's Qualification Card." It is the information on this card for which the Reception Center is responsible and upon which depends the future of the soldier and, yes, even the future strategy of the United Nations on the war fronts. Furthermore, a soldier's classification is a continuing process which is completed only at the separation of the individual from military service.

A civilian's induction and acceptance into the armed forces at an army reception center comprises two separate and distinct operations. His first contact is with the Armed Forces Induction Station, which has the responsibility of originally sorting the "raw material" for the armed forces. His second contact, usually following a twenty-one-day deferment, confines itself exclusively to the "Reception

Center." This second phase of induction classifies and assigns the new recruit. At Fort Leavenworth both "induction" operations are quartered in a single area under a unified command, and are commonly referred to as Reception Center No. 1773.

As an example of what goes on at the Fort Leavenworth Reception Center on a civilian's initial visit, let's observe the routine of several inductees as they enter the checking station with their records and preliminary physical information assembled and prepared by their local selective service boards.

After "checking in" they are sent to the Armed Forces Induction Station where the original sorting of "raw material" for the armed forces begins. Here psychologists screen out those who would make the lowest grades in the regular Army Classification Tests. The army wants men who can learn to be soldiers.

Most illiterates are rejected, but not all of them. Some show ability to learn if given a chance. For these men a Special Training Unit has been established at the Fort Leavenworth Reception Center. Generally speaking, the men assigned to this unit are unable to read and write English at a fourth grade level, are unable to speak or understand simple English, or are classified in Grade V in the Army General Classification Test. Upon completion of their processing in the Reception Center, these trainees are assigned to a Special Training Unit and are not dispatched to their normal assignments until they have developed the required proficiency to undertake a regular course of army training at a Replacement Training Center. Should the trainee, after not more than three months of instruction, fail to develop an aptness for military technique sufficient to justify further effort he may be discharged from the army.

The psychologist is not to be confused with the army psychiatrist. The psychiatrist is in the medical service, and seeks out men who have any history of a nervous disorder or any psychopathic tendencies, while the psychologist administers tests to determine the man's mental age level.

Once accepted by the psychologist an inductee receives a complete physical examination at the Medical Induction Station. If he measures up to the army's physical requirements, his Service Record is initiated.

Upon completion of this phase of induction the inductee is given an opportunity to decide what branch

of the service he prefers, that is—army or navy (*navy includes coast guard and marines*). Should he voice a preference for the navy he is turned over to naval recruiting specialists who are on duty at the Armed Forces Induction Station. If their quota has not been filled and he meets the navy's standards and physical requirements he is sent to the nearest Naval Recruiting Station to receive the oath. Thus far at the Fort Leavenworth Reception Center it has not been necessary to meet the navy's quota by "assignment." The quota has been met entirely by "voluntary preference."

The majority of inductees who "follow the army" and who have been able to meet its physical requirements are, later in the day, sworn into the army by groups and placed in the Enlisted Reserve Corps. They are then returned to their original selective service board stations for a twenty-one-day deferment. Usually, if an inductee's papers are in order at the time he reports for his physical examination, his first visit to Reception Center No. 1773 can be completed within twenty-four or thirty-six hours.

That the Reception Center can operate on a twenty-four hour basis under emergency conditions is illustrated whenever a bus load of inductees returning from their twenty-one-day deferment arrives at midnight at the main gate. A sentinel challenges the driver who is permitted to enter the Reception Center only after the presentation of proper identification.

Tired and hungry after a day's ride, the group is unloaded at the checking station and assigned to quarters. A specially prepared meal is served at the Reception Center's main mess hall before the group retires. It is not unusual for the mess staff to serve several hundred meals to those who arrive after regular mess hours.

After breakfast the next morning the group undergoes a physical inspection, and each selectee signs a statement in his Service Record to the effect that he is "in as good physical condition as at the time of induction." Each person is now tagged with his name and serial number, and is assigned to a casual company which is his "home" during his processing days at the Reception Center.

Within a few hours after his arrival the new recruit is ready to start the second induction phase, and begins by hearing a series of talks—an orientation lecture, a talk on government insurance and the Soldiers' and Sailors' Civil Relief Act, and a reading of the Articles of War—and he also sees movies on sex and personal hygiene and on customs of the service. Here again the officers and enlisted personnel make the civilians' orientation into the army as pleasant as possible by making the talks personal and sympathetic.

The discussions on insurance and the purchase of bonds are simple and clear, and usually evoke a num-

ber of questions which are well answered. At the Reception Center inductees recently have without exception taken out amounts approaching the maximum of insurance, \$10,000, and have committed varying proportions of their pay checks to the purchase of war bonds.

All the permanent personnel now carry the maximum amount of government insurance.

The Reception Center Chaplain gives the orientation talk, and this includes sound advice on moral conduct, straight talk on the army's responsibility to the men and their responsibility to the army. In closing, the Chaplain explains briefly what the war means and what these boys are to fight for.

During their stay at the Reception Center, church services are available to every denomination at the chapel. Protestant, Catholic, and Jewish services are held regularly.

By afternoon the recruit is ready to enter the test building for another step in the classification process, a step that formally introduces the recruit's capabilities to the army and sometimes makes available to the army some urgently needed war skill that even the inductee did not realize he possessed.

The tests fall into three separate categories: the Army General Classification Test, the Mechanical Aptitude Test, and the Radio Operator's Aptitude Test.

Contrary to popular opinion, the Army General Classification Test is *not* an I. Q. test. Rather it is a carefully prepared test to determine how accurately and speedily a man can answer a certain number of comparatively simple questions. It is a test of decision and of quick and accurate thinking.

The second is the Mechanical Aptitude Test. It is strictly a test of aptitude and in practice it has worked out beyond the best hopes of its originators. Not infrequently does the Mechanical Aptitude Test reveal a potential skill that the recruit himself is surprised to discover.

The third, and more recently added Radio Operator's Aptitude Test is a test of sounds to determine potential radio operators. A recent survey reveals an interesting trend among recruits going through the Reception Center. Negro recruits have distinguished themselves in this one particular test, and authorities are inclined to believe that that race's characteristic sense of rhythm permits them to distinguish easily the difference between the various sounds.

The results of all these tests are recorded completely and permanently on each Soldier's Qualification Card. The card, like the soldier's Service Record, follows him all through his army career—even to the battle front. His grades on the Army General Classification Test and the Mechanical Aptitude Test play an important part in his initial assignment and later on in his selection for an officer candidate school or service school.

# OPERATIONS OF AN INDUCTION STATION AND RECEPTION CENTER

After completing the tests the recruit gets his classification interview. The Classification Section is operated by a battery of skilled technicians upon whose ability to make the recruit feel "at ease" and give a complete and accurate picture of his life depends their ultimate success in tabulating the individual correctly.

It is the interviewer's responsibility to fill out the Soldier's Qualification Card accurately and completely. From his determinations and remarks the classification officer makes the assignment which in all likelihood will have an important bearing upon the soldier's career.

Sections 1 to 20 of the Soldier's Qualification Card portray a word picture of the individual, such as: full name, birthplace, date of birth, citizenship, marital status, birthplace of parents, education, ability to speak, read, or write foreign languages, participation in sports, talent for furnishing public entertainment, main occupation, secondary occupation, additional occupations, hobbies, highest positions of leadership, and final results of test ratings.

Elsewhere on the card is a space for previous military experience, service schools, general classification and assignment, classification in military specialties, record of current service, and a final space for remarks by the interviewer which oftentimes contain important information that develops during the

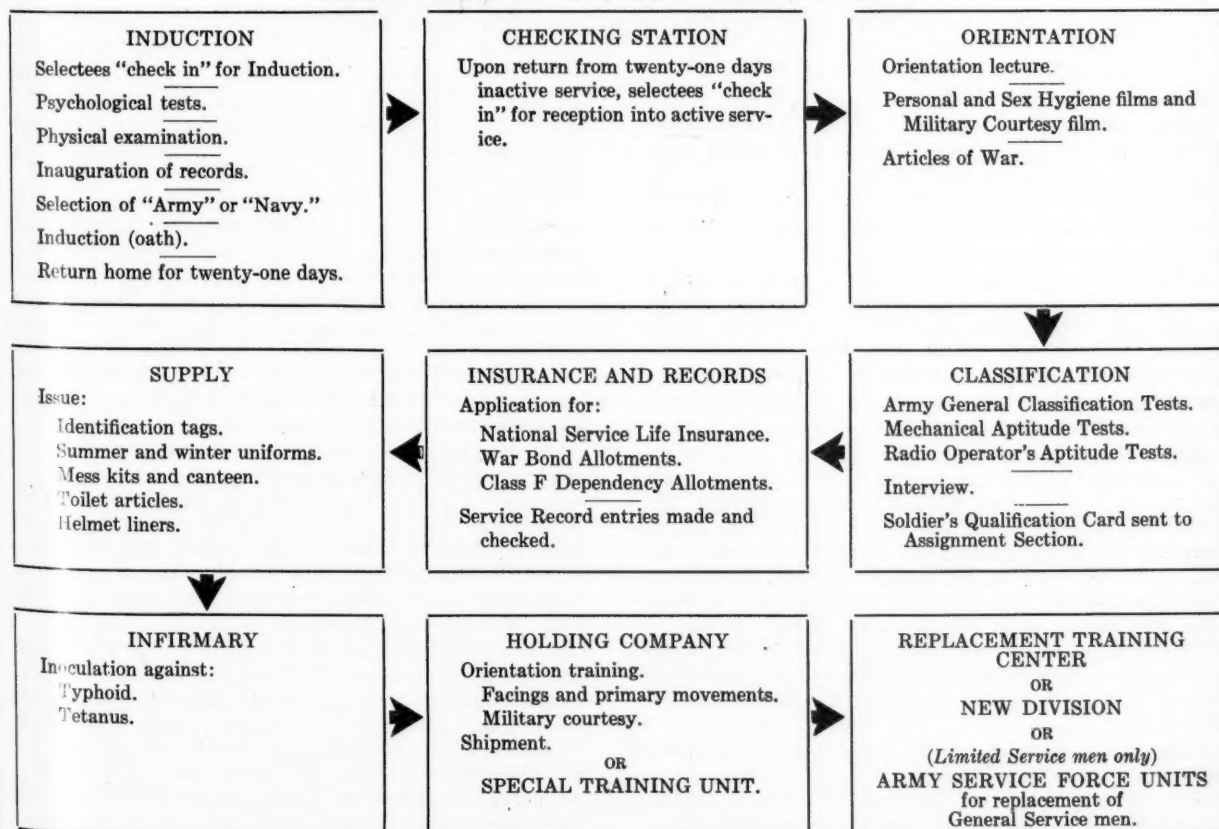
interview and which may at the time have seemed of little or no importance to the individual being interviewed.

Upon termination of the interview the recruit goes to the Insurance and Records Department where he is given an opportunity to take out government insurance, meeting the premiums by a payroll deduction. Recently in a record seven-day period for insurance sales only four inductees took less than the \$10,000 maximum amount of insurance. Following completion of insurance forms the matter of allotments and purchase of bonds is explained and the necessary arrangements completed.

Up to this point the only outward indication that the recruit is in the army is a cardboard tag, with his name and serial number, hooked on him. As he leaves the Classification Section he is about to discard his civilian clothes for the duration. Upon entering the Supply Building he is given two barracks bags and one pair of socks, and is told to strip down to his underwear. He is next given his identification tags, and then as he sits in line, waiting to be fitted for his shoes, shirts, pants, and other clothing, he observes this sign: "You are now going to receive the best clothing ever issued to any army. You alone are responsible for it. Take care of it. Be proud of it."

As he goes through the building the recruit sees the excellent shoe-fitting machine and the skilled fit-

## INDUCTION AND PROCESSING FLOW RECEPTION CENTER No. 1773, FORT LEAVENWORTH, KANSAS





ter. Clothing sizes are noted on a special clothing record which becomes a part of every recruit's permanent record. He moves down the counter where he is given two suits of khaki and wool, two fatigue suits, a mess kit, a canteen, and toilet articles.

Then, as a final check on the clothing fit, the recruit tries on all of his articles of clothing at the far end of the Supply Room. A tailor located at the Reception Center and contracted for by the government makes any necessary alterations. When a recruit leaves the Fort Leavenworth Reception Center he is fitted with a uniform of which he should be proud.

From Supply the recruit next goes through the Infirmary where he receives his initial typhoid and tetanus shots. By the time he returns to the casual company where he was originally quartered, he has been assigned to a company in the receiving battalion to await shipment. During a part of the remainder of his stay at the Reception Center the recruit is taught the rudiments of drill and assisted in every way to make the transition from civilian to army life as easy as possible.

Because the recruit's stay at Fort Leavenworth is his transition period from civilian to army life, the necessity for particular courtesy and extreme patience is stressed among officers and enlisted personnel permanently stationed at the Reception Center.

The Special Services Section provides entertainment facilities both for the new recruits and for the permanent personnel, which help materially to adjust the new recruits to army life. This section operates a large recreation building where the men are encouraged to read, to write home, and to enjoy a number of indoor sports.

Besides taking care of all visitors, the Special Services Section arranges for and directs entertainment three times weekly in the Little Theater and frequently soldiers with show experience participate in these programs. The section also publishes the post newspaper, *The Reception Center News*.

Each day the Assignment Section goes over its files and reports to the Seventh Service Command Headquarters at Omaha, Nebraska, its inventory of recruits who have completed the classification process and who are ready for shipment. Based on this report shipping orders are filled during the day according to the various types of soldiers needed.

And as the recruit leaves the Reception Center his Soldier's Qualification Card begins a journey that will follow him wherever he goes—even into the zone of combat. There a serious emergency conceivably may be met through the skilful application of personnel information gleaned at the time of the soldier's entrance into the army.

## Night Attacks in the Desert

NIGHT ATTACKS are amongst the most difficult operations of the war. This is especially true when they are made by whole armies on fronts many miles wide across country which is either featureless or whose features seem to be a continual repetition of a few common forms. Such country, in fact, as the desert.

In the desert the brilliant moonlight is apt to be both a very great help and a very real hindrance. The haze and the mirage of day are gone, the night air is crystal clear; the intense sharp-cut shadows can be picked out miles away. But strangely deceptive distractions are everywhere. Only keen and experienced eyes can detect that an apparent laager of tanks is a patch of rocks scattered over the sand.

Night attacks call for most careful planning and most exact execution. The staff work must be first rate and the troops must be thoroughly trained. Courage, endurance, initiative and system all count as in, perhaps, no other operations. The 8th Army are masters of the night attack. Long months of desert warfare have taught them all the lessons. They have learned how to move with the least possible noise, and how to cover the appointed distance in the appointed time and how to keep direction. Infantry, guns, tanks and transport, despite their widely different speed capacities, have come to work together in the nicest adjustment in the general plan.

Night movement depends even more closely than movement by day on the detailed study of the ground beforehand with the help of maps, air photographs, and land patrols. The 8th Army have brought all three means to a high perfec-

tion. Air cooperation has reached an excellence from which they expect always to be told the precise location of the enemy's main defenses, and they are seldom disappointed.

The stars also are called in aid, the constant friends of desert soldiers through the ages. Familiar stories of the campaigns of Wolseley and Gordon have been duplicated in the campaign of Montgomery. The ancient device of the pace-counter has been systematically developed. The odometer was used by the Roman legions on the march; it has been used again by the 8th Army. In their night attacks upon Rommel's successive positions, companies and platoons have had their specialists to keep count of every stride and to supply a rough equivalent of a seaman's dead reckoning.

But what has made the night attacks of the 8th Army unique has been the thorough exploitation of the latest scientific appliances of war. Wireless telephony has spread a network of command from land to air, and throughout the ground forces from G.H.Q. to the units in the front line. The receiving and transmitting sets in a division, many of them small boxes carried comfortably on a man's back, number a thousand. Light has been employed with an equal ingenuity.

Troops attacking in the dark need to be told at frequent intervals where they are and what is the position of the other troops acting with them and in their support. The command needs to know from moment to moment exactly how the battle stands. With a boldness whose results have justified it a hundred times over, the 8th Army have worked out a scheme which supplies the requisite information. [From *The Tank* (Great Britain) April 1943.]

# The Service Staff Course Ends Its First Year and Looks Ahead

COLONEL WALTER A. PASHLEY, *Quartermaster Corps*  
Director, Service Staff Course, Command and General Staff School

IT HAS BEEN generally accepted without question that the whole edifice of modern war is founded upon supply, yet the trend of military education through the years has placed the emphasis almost exclusively upon combat and its immediate ramifications. The field operation has bulked large in the instructional picture, overshadowing the vast and complicated machinery of production, administration, and distribution, and the staff work attendant thereon.

The Command and General Staff School, Fort Leavenworth, Kansas, early recognized the desirability for streamlining its tactical instruction to anticipate the needs of an army which was rapidly expanding on the ground and in the air. Two problems were posed to this army university by the parallel expansion of the army service forces:

1. Combat staff training did not satisfy the requirements of officers who came as students from staffs of service installations, or of students who were destined to be staff officers in the various installations concerned with services of supply.

2. Student officers from such sources made low academic records, because they lacked background and incentive for combat staff training.

Early in 1942 careful consideration to possible solutions to these problems was given by the Commandant of the Command and General Staff School in collaboration with the Training Division, Services of Supply Headquarters. It was agreed that there existed an urgent requirement for a type of staff training which would not duplicate nor encroach upon the special schools operated by the technical services, but which would be concerned with a level above and beyond them. Such training as envisioned was not compassed within the scope of the general staff special class program at the Command and General Staff School. It was clearly apparent, therefore, that a new and separate course with a specialized curriculum was indicated.

The decision was made to set up a separate course at the school, co-equal with the general staff course, with the following mission:

"To train selected officers of the zone of the interior for—

- a. Duty with specific divisions of the S.O.S. Staff.
- b. Duty on general staffs of corps areas.
- c. Duty in the zone of the interior, including overseas communications zones with major supply and administrative staffs."

It was determined that, while this mission fell outside the instruction given in the general staff course, about fifty hours of tactical subjects in it were applicable to the proposed course by way of background and orientation material. The remaining six-sevenths of the proposed course had to be fabricated from whatever existent subject matter could be found, or created out of the knowledge and experience of those charged with drafting the curriculum.

A tentative program was outlined on this basis and taken for approval to Washington, where the files at the Army War College and Army Industrial College were searched for further foundation material for the course.

As initially projected, the Zone of the Interior Course, with students not to be below the grade of captain, was to run nine weeks concurrently with the general staff course. Officers assigned to it were to come from corps area staffs or other staffs peculiar to Services of Supply installations, or were to be considered suitable material for such assignments. Except for cogent reasons, no officers were to be assigned as students who had attended the Command and General Staff School since 1938. Quotas were allotted to S.O.S. installations for assignment of students to the course.

In May 1942 a request was circulated by the Operations and Training Division, G-3, of the General Staff to G-1, G-2, G-4, Operations Division, and Services of Supply to submit to the Command and General Staff School any suggestions deemed pertinent to the operation of the course and any material which might be incorporated in its curriculum. Such information also was to be maintained currently by these staff divisions and forwarded to the Director, Zone of the Interior Course, so that instruction would keep pace with developments and changes in policy. The data so obtained were incorporated in the course.

At the outset, the instruction in the Zone of the Interior Course was departmentalized as follows:

Transportation  
Supply  
Personnel  
Intelligence and Public Relations  
Operations  
Air Force Supply  
Miscellaneous (economic backgrounds, utilization of resources, etc.)

The effort was made to obtain a specialist in each

of these subjects as a member of the faculty. Instructors on the faculty of the General Staff Course likewise were to be employed in the presentation of their appropriate topics, revamped from the angle of the supply and Zone of the Interior interests. In addition to the Director, there were seven assigned members of the faculty, Zone of the Interior, on 1 July 1942. A year later this number had grown to twenty.

The first Zone of the Interior class began 11 July 1942. Of the quota of fifty students assigned, forty-eight reported. The schedule of instruction totaled 357 hours. There were forty-three graduates on 12 September.

The title "Services of Supply Staff Course" had been substituted for "Zone of the Interior Course" when the second class began on 19 September. The number of students had increased to eighty and there were eleven faculty members in addition to the Director. Hours of instruction were increased to 363.

As an experiment, an exercise was added in this class whereby the staff of a simulated Service Command was operated by students who transacted the type of business normal to such an installation. The success of the initial trial led to the permanent incorporation of the service command staff exercise in the course, and this type of instruction in later classes was expanded to include the operation of a port headquarters and the headquarters of a communications zone.

The student quota for the third Services of Supply Staff Course, which opened 30 November, was set originally at 150. It was increased to 316, with 1st Lieutenants included. The instructional staff numbered fourteen.

By this time there had been a crystallization of the idea of the objective of the Services of Supply Staff Course. In the program and schedule for this and subsequent classes it was stated thus:

"To train selected officers in military organization, basic staff principles and in staff functions peculiar to zone of the interior and theater of operations installations and operations, including service commands, ports of embarkation, and services of supply in general."

In addition to the total of 370½ hours of instruction in the third class, extra instruction was set up during the first three weeks of the course in Map Reading, Accountability, Responsibility, Preparation of Requisitions, Reports of Survey, and Inventory & Inspection Reports; and Computations for Supply, Evacuation, Maintenance, and related matters. This was designed to help those students whose background was deficient in these pertinent subjects.

Graduates at the close of the class on 30 January 1943 numbered 287.

A coeducational aspect was given to the fourth class when it began 8 February when sixteen Wo-

men's Army Auxiliary Corps officers reported among the 289 students. There also were two Chinese Air Force officers.

In the fourth class, the instructional material was broken down into five phases, and this organization was followed in subsequent classes. These phases were:

*General*—21½ hours, distributed throughout the course, devoted to keeping abreast of the world situation and receiving reports of visiting officers from the field.

*Preparatory*—95½ hours devoted to the organization of the nation for war and the organization of the army, with a broad general picture of the theater of operations, including certain technique applicable to any staff officer, for later application by students during the course.

*Services of Supply, Zone of the Interior*—158 hours covering all functions of the S.O.S. in the Zone of the Interior from Headquarters in Washington through Service Commands, posts, camps, stations, and field installations of the S.O.S. ports of embarkation and coastal defense. This terminates in a map maneuver involving the operation of the staff of a Service Command Headquarters.

*Lines of Communication*—36½ hours devoted to preparation of units ordered overseas, their movements through the ports, and transport loading, culminating in a map maneuver involving the operation of a staff of a port of embarkation.

*Communications Zone*—83 hours covering Services of Supply in communications zones including traffic control, security, and military government, culminating in a map maneuver involving staff operations in principal supply installations in a communications zone.

Instructional hours were increased to 394½.

Periods of extra instruction were set up in the first four weeks of the course. All schedules were presented to the S.O.S. Class only, instead of jointly with the General Staff Class in some subjects as formerly, and all were adapted to the S.O.S. Class. The instructional staff of the Service Staff section had increased to fifteen in addition to the Director and the Chief of the Command Section.

Because the Services of Supply had become the Army Service Forces, the title of the course was revised to "Service Staff Course."

Graduation on 10 April saw 254 students, including all of the WAAC officers, successfully completing the course.

Prior to the opening of the fifth Service Staff class on 19 April, when sixteen more WAAC officers were scheduled to attend, a suggested preparatory course for two weeks for these officers was organized and forwarded. It consisted of seventy-eight hours of work for those unfamiliar with tactical studies and staff operations and included (1) Organization of



# THE SERVICE STAFF COURSE ENDS ITS FIRST YEAR AND LOOKS AHEAD

the Army, Conventional Signs, Map Reading, and (2) assignments for study in the Field Service Regulations, Staff Officers' Field Manual, and S.O.S. installations. The preparatory course was designed to make up for deficiencies in the military background of the WAAC officers.

There were 226 students, including one general officer and five foreign officers, in the fifth class. The faculty numbered seventeen, in addition to the Director and the Chief of the Command Section, Service Forces. The total of 396 hours of instruction was divided, as follows:

## By Phases

General	25 hours
Preparatory	88
Army Service Forces, Z/I	163½
Lines of Communication	36½
Communications Zone	83

## By Method

Conference	105½ hours
Applicatory Exercises:	
Exercises	168½
Map Exercises	78
Map Maneuvers	44
	290½ hours
	396

A quota of 230 had been assigned to the fifth class. Of the 226 who reported, 203 were graduated, 20 failed, and three were relieved without prejudice. The youngest in the class was 22 years of age, the oldest, 57. The average age of 37.34 compared with the average of 42.98 in the first class.

Components of the fifth class were: Regular Army 8, U.S.M.C. 1, National Guard 16, Officers' Reserve Corps 143, Army of the United States 42, WAAC 16, Foreign 5. They originated as follows:

ASF Headquarters	10
Hq, Technical Services	14
Service Command Hq.	12
Post Headquarters	24
Depots	19
Ports of Embarkation	19
Div & Dist Engr Offices	2
Repl Tr Cens	14
Induction Sta & Recep Cens	8
PM, MP, and Internal Sec Units	9
Army Exchange and Spec Services	7
Army Postal Service	4
Hospitals	17
Air Service Installations	1
Procurement Districts	5
Arsenals, Ord Plants & Prov Grounds	11
Schools (as instructors)	13
Schools (as students)	3
Overseas and Misc.	18
WAAC	16

226

A number of visiting speakers, specialists in their subjects, appeared before each of the classes during the year. Some of them who spoke to recent classes, with their subjects, were: Major General Homer M. Groninger, "New York Port of Embarkation"; Major General Frederick Gilbreath, "San Francisco Port of Embarkation"; Brigadier General J. P. Kilpatrick, "Hampton Roads Port of Embarkation"; Colonel Clement H. Wright, Headquarters, Second

Service Command, "Staff Problems in a Service Command Headquarters"; Colonel John R. Lovell, former Assistant Military Attaché in Berlin, "German Order of Battle"; Colonel Lewis K. Underhill, School of Military Government, University of Virginia, "Military Government"; Colonel Robert S. Miller, Infantry, "Operations in North Africa"; Colonel Fred C. Foy, Assistant Director, Purchases Division, Headquarters, ASF, "Renegotiation of Contracts"; Lieutenant Colonel Warren J. Clear, "Psychology of the Japanese Soldier"; Very Reverend Edmund A. Walsh, S. J., Georgetown University, "Geopolitics"; Mr. J. P. Mitchell, Director, Industrial Personnel Division, Headquarters, ASF, "Industrial Personnel Division"; Colonel Oveta Culp Hobby, Director, WAAC, "The Women's Army Auxiliary Corps"; Mr. Hanson W. Baldwin, War Correspondent for the *New York Times*, "The War in the Mediterranean"; Wing Commander Frank A. Marlow, RAF, "RAF Operations over Europe and the Near East."

The sixth Service Staff class, which began on 28 June with 217 students, including eight WAAC officers, was starting its third week of the course when the first year of activity had been spanned by the Service Force "college" of the C. & G. S. army university. Much progress had been made. The period of experimentation had passed. A definite goal had been set, a smooth running organization perfected.

During the year, the Service Staff Course has graduated more than 800 officers, equipped to function in staff positions in all types of service headquarters and installations. Many of them have gone overseas. The initial class was well represented in the task forces which invaded North Africa. Other graduates hold responsible jobs in Service Command headquarters, ports of embarkation, general depots, important stations at home and abroad, and in offices of branches and divisions in the War Department.

On the basis of the achievement record of the first year, it is firmly believed that service staff training has amply justified the vision of those who initiated it and that it has established itself as a permanent requirement in the field of military education.

Conditions, meanwhile, have been changing. When the Service Staff Course was born, the North African venture was still in the preliminary planning stage. As the first year ended, this campaign had been completed successfully and another had begun on a vaster, more important scale. As it and others develop, there will be an increasing need for more officers trained in Service Staff operations.

More graduates of the Service Staff Course will go overseas. The more they know, the better able they will be to function. It is clearly the task of the Service Staff Course, therefore, to see to it that these students get as much as possible which can be used in their overseas duties.

Experience has shown that many graduates have

gone into overseas Communications Zones. It behooves the Service Staff Course, then, to increase the work presented in this phase. An additional map maneuver, based on the Communications Zone, is indicated, wherein students will participate in problems of staff work like those they may actually encounter in the field.

This need has been recognized and its solution has been initiated in the Sixth Course. Further expansion will be necessary and this also is contemplated.

This first year has charted the path of the Service Staff Course of the future. Its very reason for existence has been the satisfying of a definite need. It must continue to produce—modifying, altering, expanding—to fill requirements. Its program must remain flexible enough to permit adaptations and adjustments to meet changing specifications.

And in the words of General Somervell, it "must continue to seek every possible means of bringing performance abreast the demands of these critical times."

## Replacement of Stolen Unit Funds by Collection Within Unit

[From *Information Circular*, the Inspector General's Office, Washington, D. C., Vol. 3, No. 4, Part 1, April 1943.]

*One thing frequently not appreciated by many of the thousands of officers who a short time ago were civilians is that certain procedures—especially those connected with the handling of funds—which may be all right or at least tolerated in civil life are decidedly wrong according to army standards.—THE EDITOR.*

DURING THE RECENT annual inspection of Fort "X," information was received by the inspector general that contributions had been collected from the men in a certain detachment to replace detachment funds which had been stolen in April 1942. These funds had been taken from a field desk in the detachment orderly tent under circumstances which seemed to fix responsibility for their loss on the commanding officer, who had been negligent in not properly safeguarding them.

The captain commanding the detachment investigated the theft but discovered nothing. He then assembled the detachment and made a speech to the men in which he told them of the loss, expressed his disappointment that such a thing would occur in his command, and stated that if the money were not returned, he would have to call in the military authorities to make an investigation. He added that the thief evidently did not realize that the loss would have to be replaced by the commanding officer who was responsible. The captain then fixed a time and outlined a plan by which the thief could restore the money without disclosing his identity. However, the money was not returned at the appointed time.

Following the failure of his first plan, the captain told certain noncommissioned officers that he supposed that he would have to "dig up the money out of his own pocket and replace it." The noncommissioned officers requested that they be allowed to handle the matter in their own way, and the captain, thinking that they could discover the thief, agreed. However, the noncommissioned officers devised a plan of raising the money by contributions from the men on a prorata basis according to rank.

Evidence uncovered later suggested that there might have been threats made that men would be confined to the post until the money was returned; however, this evidence was not conclusive. Although the captain had nothing to do with the plan, he knew that the contributions were being made and he accepted the money knowing its source. He then used it to replace the stolen funds, thus relieving himself of his personal pecuniary liability.

Testimony also brought out the fact that when the loss was discovered, the captain did not report it to the Post Commander so that a board of officers could be appointed to make an investigation as contemplated by par. 19, AR 210-50.

No entry of the collections was made in the council book nor was any record kept of the contributions made. Since the collection was in the nature of a gift to the captain to relieve him of his pecuniary responsibility, the investigating officer believed that provisions of par. 2e (6) and (7), AR 600-10, had been violated. This subparagraph states in part: "... nor shall any such officials (officers) or clerical superiors receive any gift or present offered or presented to them as a contribution from persons in government employ receiving a less salary than themselves. . ."

The captain, who was an efficient and diligent officer, well regarded by the men and highly esteemed by his Post Commander, was not aware of the fact that the manner in which the transaction was handled was in violation of any regulations.

Evidence also showed that many of the men were still in the detachment, and that the contributions which they had made could be returned to them. The inspector general who made the investigation recommended that the captain be required to return the contributions to the men, and that he be reprimanded for the irregularities noted.

# Artillery in a Penetration

LIEUTENANT COLONEL C. H. DONNELLY, *Field Artillery*  
Instructor, Command and General Staff School

(Note: The units referred to in the assumed situation are fictitious, and are not in any way supposed to represent actual units.—C.H.D.)

## INTRODUCTION

THE PENETRATION, from the viewpoint of its tactical conception, is the simplest form of attack. Basically it involves nothing more complex than the selection of a remunerative objective and then punching straight through to reach this goal. The execution of a successful penetration is far from simple. It involves the utmost in coordination of the efforts of all supported and supporting units. This means that complete and detailed plans must be made for all the participating units. The purpose of this article is to discuss the employment of the artillery in a penetration, with special emphasis on the planning phase.

In a penetration, artillery plays a major part in *maintaining the momentum of the attack*. Supporting combat aviation and mechanized units will also help to keep the attack rolling, but the chief load is on the artillery. To accomplish this, artillery technique has been greatly improved over that of 1918. In World War I, the play most often used was a rolling barrage behind which the infantry would advance until the limit of range of the artillery was reached. Then the infantry had two choices: to continue without artillery support, or to dig in and wait until the artillery could be displaced forward. Displacement was slow, due not only to road congestion but also to the practice of employing all the artillery on the barrage and then displacing the bulk of it at one time. The infantry suffered whether it adopted choice one or two. Assault troops nearly always take punishment when they try to advance without artillery help. In the other case, the doughboys could be sure of a pounding from the German artillery while waiting for their own guns to come up and help them resume the attack. Today, we have abandoned the rolling barrage, except for special cases. Our technique is to give close support of the assault troops by more frequent displacements, and to mass fires on critical areas as needed. Continuous fire support is made possible by moving only part of the artillery at one time, the remainder staying in position and continuing fire until the displacing batteries have reoccupied positions and are ready to resume fire. The bulk of the division artillery can be quickly massed at the will of the commander because of improved communications and fire direction methods.

## ARTILLERY PLANNING

To support a penetration successfully, especially where the enemy defenses are well organized, the artillery must accomplish a tremendous amount of

preparation. Complete and detailed plans must be prepared. This usually requires several days. Therefore if the firing batteries are to be ready to support the attack at H hour, prior planning must be carried on *concurrently* in all echelons. In words of one syllable, this means that staffs, from the top down, must not hold back their plans but must let those below know what is in the wind. If a corps staff, for example, does not let its divisions know about its plans until they are complete, it is almost certain that the division staffs will not be able to do a good job of planning and be ready to attack on time. It is a mistake for a high echelon not to divulge plans until finally approved, on the ground that there may be some changes. Even if there are some revisions of the original plan, and there generally will be, lower units can usually modify existing plans more quickly than they can make new ones.

Many general staff officers do not seem to appreciate what the artillery must do in advance of an important attack. Here are some of the important tasks:

*Provisions for reinforcing artillery.* Corps Artillery Officer makes recommendations to Corps Commander. Corps Commander approves and forwards to Army. Army Artillery Officer consolidates requests from its corps, submits them to Army Commander who approves and forwards to Theater Commander. Theater Commander makes allocation based on available Theater Reserve Artillery and on his estimate of Army's needs. Army Commander reallocates to his corps. Corps Commander retains part under corps control and reallocates balance to divisions.

*Organization of artillery for combat.* This must be done early, so that supported and supporting unit commanders may get together and plan the use of the artillery. Also important in order to let artillery commanders plan their reconnaissance and occupation of positions, surveys, communications, and liaison.

*Reconnaissance.* For positions, CP's, OP's, base and reference points. Because of limitation on the number of personnel permitted in forward areas during daylight (counterintelligence), this will take more time than otherwise.

*Surveys.* For purposes of secrecy, the reinforcing artillery which is brought in will usually be prohibited from firing until the attack. This precludes registration and puts a premium on careful surveys, that the fires may be as accurate as possible.

*Installation and coordination of observation fa-*



*cilities.* Because of the amount of artillery engaged, there may be a shortage of desirable OP sites. In order that available observation may be employed to the best advantage, Corps Artillery Officer should see that all observation facilities are coordinated.

*Liaison.* Presence of a large amount of reinforcing artillery means that SOP liaison arrangements will not be sufficient. Efficiency of the liaison sections will have a great bearing on the speed with which fires can be massed and other missions delivered.

*Installations of communications.* Primary reliance will be on telephones. A large number of lines will be needed. Care must be used to prevent damage to these by our own motor and mechanized vehicles. Radio will be available only for emergency use; most radio circuits will have to be reserved for supporting aviation and tanks, and higher headquarters. Narrow division zones of action and presence of large numbers of reinforcing troops (both characteristic of penetration) mean terrific congestion of radio channels. Frequencies must be allocated, priorities fixed, and codes decided upon.

*Ammunition supply.* Large quantities of ammunition must be dumped near battery positions prior to the attack. Most of this will be hauled during darkness when the reinforcing artillery is coming into position, involving careful traffic control. Resupply must be adequate and there must be no failure.

*Occupation and organization of positions.* Incoming artillery must be brought up during darkness; it is then concealed in positions of readiness near firing positions or, if practicable, emplaced in positions which have been well camouflaged. Important factor is secrecy. To avoid congestion, careful and detailed plans must be made governing movements of reinforcing artillery from time it starts movement toward zone of action until batteries go into position.

*Coordination of antitank and antiaircraft security of artillery positions.* Should be supervised by the Corps Artillery Officer. Otherwise each battery or battalion will organize its own defenses and the result will be a hit-or-miss plan, not nearly so effective as a coordinated plan for the artillery as a whole.

*Coordination of supporting fires.* Corps Artillery Officer will coordinate all counterbattery and long range interdiction and harassing fires. Division Artillery Officer coordinates the direct and general support fires within his division. He arranges with adjacent divisions for artillery support, such as neutralization of enemy observation, defense against counterattacks, and reinforcement of fires of his own divisional artillery.

*Coordination of artillery with combat aviation.* Corps Artillery Officer is also charged with coordinating the fires of his artillery with close support missions of the combat aviation.

*Computation of firing data.* Since most of the fires during the early stage of the attack will be pre-

arranged, battalions must make schedules of these fires, assign priorities, and determine ammunition expenditures. Firing data must be prepared for all batteries for all targets on which they may be called to fire.

The foregoing should give the staff officer a rough idea of why the division artillery staff is always figuratively camped on the division headquarters door step seeking information.

#### ORGANIZATION FOR COMBAT

This means the grouping of artillery in such manner that provision will be made for every support mission.

We must start with the premise that in a penetration, the division commander wants *centralized control* of his artillery at all times. In a straight-down-the-alley operation, characteristic of this form of attack, wide maneuver is obviously impracticable. Hence there is no occasion for the combat team formation, at least until the objective has been seized and pursuit begins.

To illustrate how artillery is organized for combat in an attack by penetration let us follow through an assumed situation.

A Blue group of armies is engaged with a strong Red force on a wide front. The Blue Commander decides to resume the attack with the First Army making a penetration, which is to be exploited by armored and motorized units. First Army Commander designates his I Corps to make the main effort and the Corps Commander orders his 10th and 12th Infantry Divisions to make the main attack, 12th Inf Div to assist the 10th. The 10th and 12th Inf Divs have been strongly reinforced with artillery, engineers, tank destroyers, and reserve tank battalions. Combat aviation is supporting the First Army.

On the morning of October 28 the I Corps Commander has a conference with his division commanders during which he explains his plan of attack, announcing that the attack will jump off at 0715, 31 October, and that prior to that time the 10th and 12th Inf Divs will relieve the 2d Inf Div (less artillery) which is then in line. The 2d Inf Div Arty, less one light battalion, will be attached to the 10th Inf Div; this one light battalion will be attached to the 12th Inf Div. Other attachments to the 10th Inf Div include the 901st FA Group, consisting of 971st, 972d, 973d and 974th FA Bns (all 105-mm howitzer); 902d FA Group, consisting of 960th and 961st FA Bns (155-mm howitzer); 901st Tank Group, consisting of three medium and one light tank battalion. The I Corps will also have its FA observation battalion, eight battalions of 155-mm howitzers, and four battalions of 155-mm guns. During the attack, approximately half of the corps artillery will be firing in the zone of action of the 10th Inf Div.

# ARTILLERY IN A PENETRATION

For the plan of attack of the I Corps and the 10th Inf Div, see Figure 1.

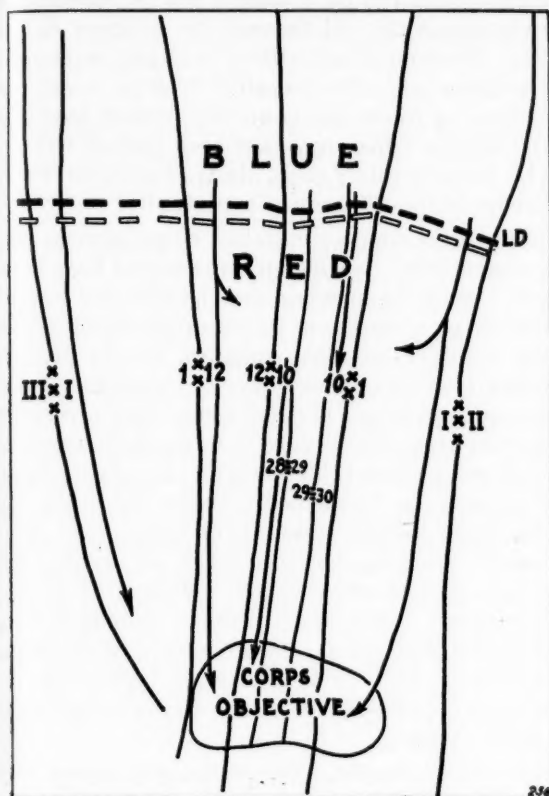


FIGURE 1.

The 10th Inf Div Arty O learns that the 28th and 30th Inf will each have one battalion of medium tanks attached. He is now ready to plan his organization for combat.

He first takes stock of his available artillery and finds that he has nine light battalions [37th, 38th, and 39th (organic in 10th Inf Div), 6th and 7th (from 2d Inf Div), and the 971st, 972d, 973d, and 974th (from the 901st FA Gp)]. Also four medium battalions [40th (organic in 10th Inf Div), 8th (from 2d Inf Div), and 960th and 961st (from 902d FA Gp)]. The major units of the 10th Inf Div which will need direct support artillery are the 28th, 29th, and 30th Inf regiments, of which the 28th Inf and 30th Inf each have a medium tank battalion attached.

In deciding on direct support artillery the Div Arty O notes that the 30th Inf makes the main effort initially and later the 28th Inf takes over this task. He also keeps in mind that his Div Arty Hq cannot handle efficiently more than six separate battalions or groupments. Finally, any organization for combat must meet the test of flexibility, that is it must be such as to enable the Div Comdr to mass all of his artillery fires on a given area in the shortest space of time. *Most of the massing of fires will be to assist the main effort.*

Obviously there may be many satisfactory solutions to this problem. One solution, believed to meet

the requirements in the preceding paragraph, is shown in Figure 2.

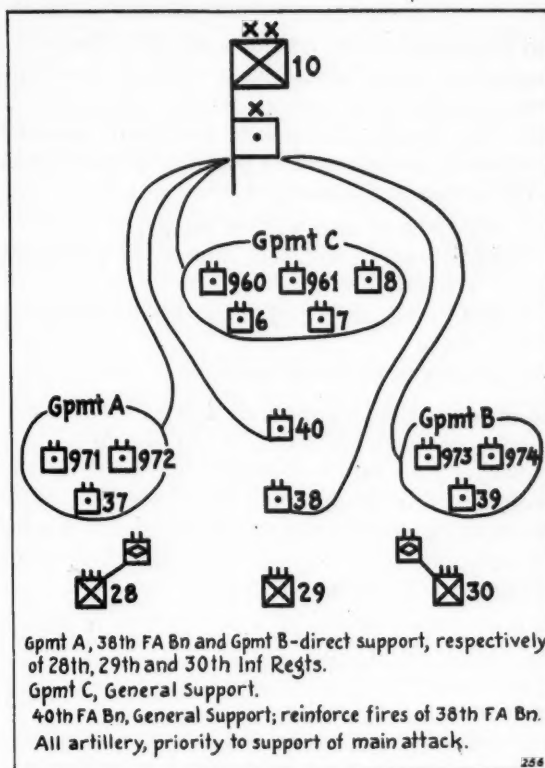


FIGURE 2.

In arriving at this solution, the Div Arty O reasoned that since the 28th and 30th Inf Regts would have the hardest job, they should have the bulk of the direct support artillery. He also knew that he could use the 2d Inf Div Arty O and the Colonels commanding the 901st and 902d FA Groups, with their respective headquarters and headquarters batteries, to excellent advantage in helping to control all of this artillery. This plan of control should take much of the load off the Div Arty Hq without sacrificing advantages of centralized control.

The 2d Inf Div Arty O will command Gpmt C; Col "901st FA Gp" commands Gpmt A and Col "902d FA Gp" commands Gpmt B. The 10th Inf Div Arty O will command the artillery of his division, even if he is junior in grade to 2d Div Arty O.

Note that the solution stays within the limitation of six separate battalions or groupments.

At this point it may be wise to call the reader's attention to the difference between "Group" and "Groupment." The former takes the place of the old regimental organization, the chief difference being that the number of battalions in a group will vary from two to six. The Group Hq and Hq Btry are permanent but the number and designation of its battalions are not. The groupment is a temporary tactical grouping of units from different organizations, all of which have a common mission. Groupments are made according to mission, not caliber

(note Gpmt C), and are formed to facilitate control during an engagement.

#### THE ARTILLERY PREPARATION

No discussion of the employment of artillery in a penetration would be complete without something in regard to the preparation. Shall a preparation be fired? The decision is made by the force commander. Certain factors must be considered before making this decision. These are

- adequacy of ammunition supply,
- knowledge of sufficient number of remunerative targets,
- sufficient time for plans and computation of data,
- secrecy as to intentions.

In the preceding situation, we may assume the first three factors are favorable. As to loss of secrecy, advantages to be gained should far outweigh the disadvantages; during a preparation of medium length immediately preceding the attack, the enemy will not have sufficient time to make any important shifts of reserves or to regroup units.

A preparation preceding a penetration is usually longer than in an envelopment. A short, violent preparation is much more effective than a longer, milder one.

The purposes are to disrupt enemy command and communications systems, neutralize his artillery and other support weapons, interdict movement of reserves to the threatened area, and to generally soften up the enemy forward battle position. A well planned and executed preparation will save many lives. The length will depend on the number and character of targets, the amount of artillery available, and the strength of the hostile defense areas. The decision in the preceding situation was to fire a preparation lasting one and a half hours.

#### SUPPORT OF THE ATTACK

As stated before, the rolling barrage in support of an attack has been discarded, except in special cases. Two reasons for this were waste of ammunition and lack of flexibility of control. Once the barrage was under way it was extremely difficult to stop and shift to other fires. Hence, if infantry following it were held up, their barrage went on and left them unsupported. This form of artillery support still has its uses, however, especially on limited areas which are known to be strongly organized and held, but of which definite information as to targets is scanty.

The most common type of artillery fire support is that of firing successive concentrations. Prior to the attack the infantry regiment commanders discuss their plans with the commanders of their direct support artillery. Known, or possible, targets, are plotted and each is given a number. Data are prepared for each target area, these being referred to as prearranged fires. Arrangements are made to fire initially on these areas in certain sequence, the

artillery lifting from one concentration to the next on signal or call from the infantry. When the infantry desires fire on a target, out of sequence, it simply makes the call through the artillery liaison officer. Since no attack is likely to go just as planned, the artillery will often be called upon to repeat certain fires, or to deviate from the planned sequence. Many targets which have not been plotted will appear. Some artillery must always be designated to take care of these targets of opportunity.

Each direct support battalion or groupment prepares an overlay showing all prearranged fires, numbered. Blocks of numbers may be assigned to each battalion or groupment to eliminate duplications. These overlays are then combined by the division artillery staff into a *master overlay* showing all prearranged fires in the division zone. Any targets or suspected areas which have been omitted should be plotted and assigned to some unit. Similarly, duplications may be reassigned. These omissions and duplications usually occur along boundaries; their elimination is what we mean when we say that the division artillery officer has coordinated the fires of his artillery. Fires along division boundaries are checked by conference between staff officers of the two division artillery headquarters. Final coordination of these fires is the responsibility of the Corps Artillery Officer.

The general support battalions or groupments are given copies of the master overlay. Priorities of fire are designated but there will be frequent departures from these. In fact all artillery with the division must be prepared at all times to suspend any firing and to shift at once to targets designated by division artillery headquarters.

#### CONCLUSION

In an attack by penetration, it will usually be necessary to bring in strong artillery reinforcements. This affects counter-intelligence because of necessary reconnaissance and survey, and movement into positions.

Several days are generally necessary for planning and preparations for supporting the attack.

All artillery with the division will be held under division control, at least until penetration is actually made.

Organization for combat of the artillery must provide sufficient strength for direct and general support missions, and must permit quick massing of fires. Fires will usually be massed *to assist the main effort*.

A preparation of medium length, that is about one to two hours, violent in nature, should precede the attack, unless unusual conditions exist making it advisable to attack without a preparation.

The attack is supported by successive concentrations. The division commander masses his artillery fires on critical areas to help along those units in difficulty.



# Separate Tank Groups

Prepared for the MILITARY REVIEW by the Armored Section,  
Command and General Staff School

In addition to armored divisions, we now have in our service separate armored groups. For the purpose of training and administration they are organized into three distinct types: separate tank groups, separate armored infantry groups, and separate armored artillery groups. Each of these groups consists of a headquarters company and two or more separate battalions of one type.

For operations in battle a separate group may be formed with any combination of arms. For example, a group might consist of a headquarters company, two tank battalions, and one armored infantry battalion. At times an armored field artillery battalion would be included in the group. The separate armored groups and tank battalions are designed for attachment by group or battalion to corps or divisions both infantry and armored, to give added striking power.

When attached to corps containing infantry divisions, or to infantry divisions, the separate tank battalion assists the advance of the infantry by neutralizing or destroying automatic weapons likely to hold up the advance of the foot troops; maintaining neutralization of hostile resistance until the arrival of foot troops on the objective; destroying hostile reserves and artillery in the battle area; making passages through wire and other obstacles except anti-tank obstacles; breaking up hostile counterattacks; counterattacking to break up an enemy attack while forming or to eject an enemy that has penetrated the position; and supporting an infantry attack by fire.

The fundamentals of surprise, mass, cooperation, economy of force, retention of the initiative, security, coordination, and use against vital objectives apply as well to the separate armored group and tank battalion as to the armored division.

When terrain is suitable the separate armored groups and tank battalions are allotted to the main effort. To secure the advantages of mass employment, it is desirable to use the group as a unit. The detachment of individual platoons and companies dissipates the strength of the battalion and should be done only under exceptional circumstances.

The primary objective of separate tank units is the main objective of the unit to which they are attached, or an objective the taking of which will vitally affect the action. Employment of tank units against minor objectives is a waste of their great striking power.

To reach their final objective, tanks supported by foot infantry usually attack successive objectives. The initial objective is close enough to the line of departure that the infantry may advance rapidly be-

hind the tanks and promptly occupy it. The early occupation of objective by the infantry is necessary in order that the tanks may not be subjected to massed artillery and antitank fire; may not have to remain on the objective for an extended period; and may rally, reorganize, and continue the advance before the enemy has a chance to organize an anti-tank front.

The attack of tanks in support of infantry is divided into six phases: reconnaissance, preliminary coordination, preparatory fire support, the tank assault, the infantry assault, and consolidation and continuation of the attack.

Separate tank units perform only close and battle reconnaissance. The unit to which they are attached must furnish available information of the enemy and terrain that will be of assistance to the tanks. The tank unit commander both personally and by use of reconnaissance personnel makes a detailed reconnaissance of as much of the area of employment as practicable. Reconnaissance by plane should be made when practicable. After learning the commander's plan the tank unit commander then submits his recommendation for use of the tanks. Reconnaissance is continuous, and throughout the action the tank unit commander constantly advises the supported unit commander on appropriate tank missions.

The success of the tank action will depend upon the coordination of all available means. These include: artillery and air support; support by infantry weapons; movement of tanks through other units to their attack; position; advance of foot troops; use of smoke; engineer support; arrangements for liaison and communications.

Prior to the attack the tank unit commander, by conference with the commander of the unit to which he is attached and interested staff officers and commanders, arranges for necessary coordination. Prior to commitment he establishes close liaison with the unit to which he is attached and maintains this liaison throughout the action. A liaison officer remains at the CP of the supported unit.

Tank units move direct from assembly areas to attack positions where they may halt for not more than a few minutes to effect last-minute coordination. Arrangements for passage through infantry must be made. These arrangements are made by tank personnel contacting the infantry, and the posting of guides and guards by the infantry.

Engineer support must be furnished to assist the tanks forward and to remove mines.

Unless the attack can be launched with complete surprise against an enemy known to be weak in antitank guns, a preparation of artillery should be fired on known or suspected locations of hostile antitank guns and observation posts. Smoke is used when practicable, care being taken that its use does not interfere with the attack. Air bombardment should neutralize hostile artillery beyond range of friendly artillery. Infantry weapons support the attack. Artillery forward observers in radio-equipped tanks or other vehicles advance to observe and to call for necessary artillery support as the attack progresses.

The tank battalion advances by fire and maneuver in a series of waves, on a front rarely exceeding 1000 yards. For a sustained effort the attack must be in depth. If two battalions are available the advance is normally in a column of battalions. Armored infantry when present follows the leading battalion.

Upon reaching the objective, tanks crush any remaining enemy resistance and then move to defiladed or concealed positions until the infantry arrives. Some tanks are placed in position to cover the objective by fire and to repel counterattacks.

When ground over which the attack is to be launched is unsuitable for tank operation or is protected by mine fields, other tank obstacles, and antitank guns, the infantry attacks first, to secure ground from which the tanks may attack, to breach the mine fields, and to destroy the obstacles and antitank guns. In addition to the artillery support of the attack, medium tanks from positions well forward may be used to support the attack by either direct or indirect laying methods. The firing of extensive concentrations by tanks cannot be expected unless additional ammunition is made available at the tank. After their initial fire mission is completed the tanks should move forward with complete load of ammunition.

When the obstacles have been breached or suitable terrain is reached, the tanks move through the infantry and continue the attack. The infantry moves forward with all practicable speed to occupy the position taken by the tanks.

The infantry occupies the objective and places antitank guns to repel a mechanized attack. Under this protection the tanks rally, reorganize, and prepare for further advance or to repel a counterattack.

In the attack of towns, separate tank units may support the attack of infantry by assisting in breaching the outer defenses. As the infantry attacks the town proper, tanks support it by fire. Small groups of tanks may be used to support infantry in the streets of the town.

In defense, separate tank units are held under cover in a position from which they can move quickly

to assist in ejecting the enemy from the position, strike an enemy forming for the attack, or repel an attack from the flank.

Plans are made for counterattack, routes selected and improved, and arrangements made for fire support and coordination with other units. At times tanks may be required to counterattack without supporting fires.

In a night withdrawal, tanks are moved to the rear soon after dark as they will be of little use during darkness.

In a daylight withdrawal, tanks supported by artillery and air make limited objective attacks to throw the enemy into confusion and give the supported troops time and space to withdraw.

In delaying action, tank units may be a reserve for the covering force. They are located to repel attacks from the flanks and to make limited objective attacks to assist the delaying force to withdraw.

Separate tank units, having only limited supply and evacuation facilities, are dependent upon the unit to which attached for assistance.

An ordnance heavy maintenance company should be available for third echelon maintenance. Ordnance evacuation companies assist in evacuation of disabled tanks. The ordnance heavy maintenance company must give close support to tank units attached to the division. Where necessary, detachments of the company follow the tanks closely.

Although there is no such thing as a normal formation, practice more or less demands a schematic diagram for employment as a basis from which to adjust for each situation.

An infantry division having a reinforced tank group consisting of three tank battalions and one armored infantry battalion attached, may in attack utilize the group in the following manner. A tank battalion can be attached to each of the two infantry regiments making the assault. The infantry regimental commander will use the tanks as a fourth battalion of his regiment in reserve. If and when the opportunity develops for the use of this powerful reserve, it will be committed with the infantry reserve battalion against limited objectives capable of being reached by the foot soldiers. The third battalion of tanks and the armored infantry battalion can be the divisional commander's reserve, to be committed mainly against deep objectives and in cases where exploitation of the successes of the infantry regiments appears feasible.

The separate tank group is a powerful reinforcing unit placed in the hands of the higher infantry commanders to give added impetus to the infantry attack. Used according to the rules discussed above, it should not only insure success but also save flesh and bone of the supported infantry.

# Artillery-Infantry Liaison

LIEUTENANT COLONEL JOSEPH C. GRUBB, *Field Artillery*  
Instructor, Command and General Staff School

SINCE World War I we have made excellent progress in our coordination and cooperation between the supported and supporting arms.

We have come to speak of the combat team as glibly as we refer to the battalion. Commanders play it in map exercises and field maneuvers with all the sure confidence of a baseball manager planning a game on his home grounds. And when our artillery is employed in direct support of our infantry, cavalry, or armor we would no more question the effective coordination of the artillery and its supported unit than the baseball manager would doubt that of his battery.

That is all very well. But do actual conditions always justify that confidence? In the map problems we must, perforce, assume a great deal. And, anyhow, "The fog always lifts in the morning, when requested by old General A." In the field, actuality and not assumption governs. For every degree of departure from perfect coordination between the artillery and the supported unit we lose a corresponding degree of effective fire-power. Yet all too often in maneuvers an artillery battalion is called upon for fires which can be more effectively and economically executed by the infantry heavy weapons.

The Book says "Artillery . . . contributes to the movement of the entire force through the fire support which it renders other arms . . .," and "the assignment of direct support missions to artillery units permits direct cooperation with the supported units and enables it to act with greater promptness in meeting the requirements of the rapidly changing situation on the front of the supported unit."

How is this direct cooperation to be accomplished? That is just one of these simple, one dollar questions, and the answer—"liaison"—rolls back like a thunder-clap. So far, so good. And what is liaison? The answer to that one is in the book too, and everyone is familiar with it.

Command liaison begins with the division artillery commander's association with the division commander as a special staff officer. The commander of the artillery battalion in direct support maintains liaison with the commander of the supported infantry regiment by personal contact. Their CP's are situated as closely together as possible, and if conditions do not permit this an artillery liaison officer is detailed to the regimental CP during the battalion commander's absence.

It is here that the contact between the two units begins to get down to brass tacks, and to the detailed

planning upon which the success of the action depends so heavily. Together the two commanders work out the details of the plan of fire. The artillery plan is tailored to fit the mission of the infantry as closely as possible. And the infantry commander adjusts his plan to obtain the maximum benefit from the fire of the artillery. It is not to be assumed, however, that one conference at the time the action is planned initially is sufficient. The joint planning is a continuous process throughout the engagement.

Valuable as this close personal contact between the two commanders is, it alone is not enough. The artillery commander must have detailed information from the front line; information of the current situation as seen through the eyes of an artilleryman occupying a seat in the first row. And the front line infantry battalion commander must have the advice of a skilled artilleryman who is familiar with all the intimate details of his own particular situation. This brings us to the next step, the liaison section sent from the artillery battalion to each front line infantry battalion.

Now let us consider what is required of this liaison officer who represents his commander in the line, never forgetting that "Close contact . . . gives the artillery the intimate knowledge of the infantry situation which it requires for the effective performance of its mission."

The artillery liaison officer is, in effect, an extension of his battalion commander's person. He must be capable of giving the commander to whose headquarters he is assigned the same sound advice and assistance his own commander would provide. He must be tactful, and have the knack of getting along with people who are tired and immersed in their own problems. He must know to a hair the capabilities and limitations of his own battalion. He must be resourceful, self-reliant, and have a large share of initiative. He must be capable of maintaining a running estimate of the situation as it affects the unit his battalion is supporting and those units adjacent to it, so that he can plan ahead for the needed supporting fires. He must have a thorough knowledge of infantry tactics and organization, its capabilities and limitations, and its weapons. Otherwise he cannot evaluate the constantly changing factors which influence his mission, nor can he give the infantry commander full and effective advice concerning the use of the artillery fires available to him. Further, unless he has this knowledge of infantry he cannot discern between the important and unimportant de-



velopments, and in keeping his commander informed of the situation he will either send back a hodge-podge of messages, or will overlook some vital points and pick up others of little or no value. He must have sufficient experience and rank so that his opinions and advice will be given due consideration by the supported commander. And he must be skilled in the conduct and adjustment of fire so that he can take over the duties of the forward observer if need be.

All of this implies that the liaison officer must be the equal of any officer in the battalion. He must be thoroughly familiar with the duties of S-2 because much of S-2's information will come from him. He must know S-3's job so that he can make helpful, intelligent recommendations based upon his first hand knowledge of the situation. And he must be at least as experienced and well-trained as the battery commander, with whose duties he must also be familiar. Moreover, he must be capable of working alone, because he does not, as the others do, have other artillery officers available with whom he can confer before making a decision.

None of this is set forth as a matter of recent discovery. It has been preached for twenty-five years and is all set forth in Field Manuals 6-20, 7-5, 100-5, and 101-5. The need for officers of high caliber to serve in that capacity is such that our new Tables of Organization for the light battalion of organic division artillery provide captains as liaison officers and have increased the number of liaison sections from two to three per battalion.

Yet how often do we see a young, inexperienced lieutenant assigned to this important duty? There is still too great a tendency to assign those officers of the battalion who are least needed elsewhere, on the apparent theory that the more highly skilled officer personnel are a vital necessity in the batteries and on the staff, and that the liaison officers can learn their own functions by performing them after their assignment.

It is understandable that the battalion commander should keep his attention focused on the objective of a perfectly trained unit and that he should make the maximum use of all capable officers to this end. But the policy overlooks the fact that the place for the liaison officer to get his training and experience is with the artillery unit, and not while he is on a semi-independent assignment where all of his energy and ability is required to perform a job which presupposes his complete qualification. Consider the probable future value of an officer so assigned. It will not take long for the infantry commander to determine his inadequacy. He will be received because instructions require it. But having started out under a cloud, the chances are that no matter how well he may develop he will remain a "prophet without honor," and represent the loss of a potentially good officer. Unless the supported unit has complete con-

fidence in the artillery liaison there will be little cooperation, for the liaison represents the support. And the time the unskilled liaison officer spends futilely on his assignment would be much better spent with his own unit where he can gain his knowledge in the proper way.

It may be argued that a shortage of capable and thoroughly trained officers prohibits their assignment to liaison duty. Yet it will be found profitable to select three outstanding officers for these sections where they are on their own so much of the time. Their replacements can be trained within their units where the supervision is available. It is submitted that the sole reason for the existence of the artillery is the support of the infantry, cavalry, or armor in contact on the ground. That support cannot be rendered with complete effectiveness without close coordination. And perfect liaison is the key to coordination. It is not too much to say that a battalion with only a mediocre staff and passably efficient batteries, but excellent liaison, can do a better job of support than one which is top-flight in gunnery and staff work, and depends upon unsatisfactory liaison sections.

Assuming that we have an artillery battalion commanded by a capable, experienced officer who knows his artillery from Alpha to Omega, three liaison sections that are models, and an infantry regiment commanded by an officer who is a master in his own field, do we then have all the factors necessary to perfect coordination?

It is insufficient that each commander be proficient in only his own arm. In the final analysis, cooperation depends upon mutual understanding, and that understanding cannot exist if each is ignorant of the other's problems and how these problems affect the solution of his own. This knowledge of the other's field should cover the entire range of their employment—weapons, supply, movement, and tactics. It is not necessary that it be the knowledge of the specialist—just a good working knowledge is enough.

In the preliminary preparation of a fire plan the supported commander who is ignorant of the capabilities and limitations of his supporting artillery will more often than not request fires which his own weapons can handle. He wants to save his ammunition. Conversely, the artilleryman who is unfamiliar with infantry matters is apt to honor such a request without protest. Of course, he is required to comply with all requests from the supported unit which are within his capabilities. But in this case, being ignorant of the capabilities of the weapons, he doesn't realize that he is hampering the execution of the mission rather than supporting it. When each knows the other's point of view and the reasons for it, the adjustment is simple.

The artilleryman may select a position area for his battalion which is the exact location the supported commander had decided upon for his reserve.

Unless each understands the relative effect of the other's plan upon the outcome of their joint mission, the wrong decision may be made.

There are a myriad other examples which might be cited, if necessary, to prove that each should know the possibilities and limitations of the other's arm.

If this seems like a large order, stop and consider:

The supported and supporting units are but two parts of a team which develops the plan and power for the execution of a mission. Without perfect coordination the plan and power cannot be developed. Each member of the team must understand the characteristics and language of the other to effect that coordination. It is injurious to omit any step that will increase the effectiveness of the team as to omit one which pertains to the individual arm—and as inexcusable.

## The Tyroller Combat Group

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Signal* 2 April 1943.]

THE FLYING FIELD, located in a narrow sector of the Don front, was a mile by a mile and a quarter in size. It was encircled by a Soviet breakthrough of the German defense line. Five weeks later the name of this flying field and that of its German commandant had become famous on the Don front.

Forty-six-year-old Lieutenant Colonel Tyroller, who on 24 December 1942 received the Knight's Cross and was in command of a light antiaircraft battalion, assumed command as senior officer at the moment of the encirclement. Out of his nearly 2000 men he built up a combat group whose nucleus consisted of the light antiaircraft batteries of his battalion. To the Tyroller combat group belonged men who wore yellow, brown, and black collar tabs, i.e., aviators, ground personnel, railroad troops, construction troops, members of alarm companies, and trains and columns of all sorts. This formation was made up of sixty-five different units of the German Armed Forces. There was, in addition, an Italian antiaircraft artillery unit and a few faithful native volunteer helpers. All these men made up the Tyroller combat group which day after day withstood the vicious attacks of the enemy.

At first the Soviets were uncertain of the strength of the forces occupying the defense positions. Two of their regiments attacked on the day before Christmas. For two days and a night the small group fought against the attackers. For two days and a night Soviet guns and heavy mortars poured their fire on the flying field and new waves of Bolsheviks kept springing out of the dark ravines in the forefield to attack the German positions. Companies and battalions charged ten-man groups of the defenders. Companies and battalions went down under the defense fire of the combat group whose few heavy weapons were flown to it by transport planes. After a heavy attack, ominous quiet would settle down over the front for a short time. The Soviets suspected that the Germans had set a trap for them here. They would send scouting detachments forward in order to learn the strength of the defenders. But the men of the combat group were determined to hold the field as long as the higher command required it. They kept firing, changing their positions day after day, and sending out scouting detachments until their ammunition began to run low.

Then transport planes came roaring through the air. The

aviators were helping the aviators. They brought in cartridges, shells, hand-grenades, rifles, bread, canned food, and cigarettes. They came roaring up, flying at a very low altitude, slipping down into the valleys and springing over the groups of hills. They remained on the field but a short time after landing—unloading their cargo and picking up the wounded.

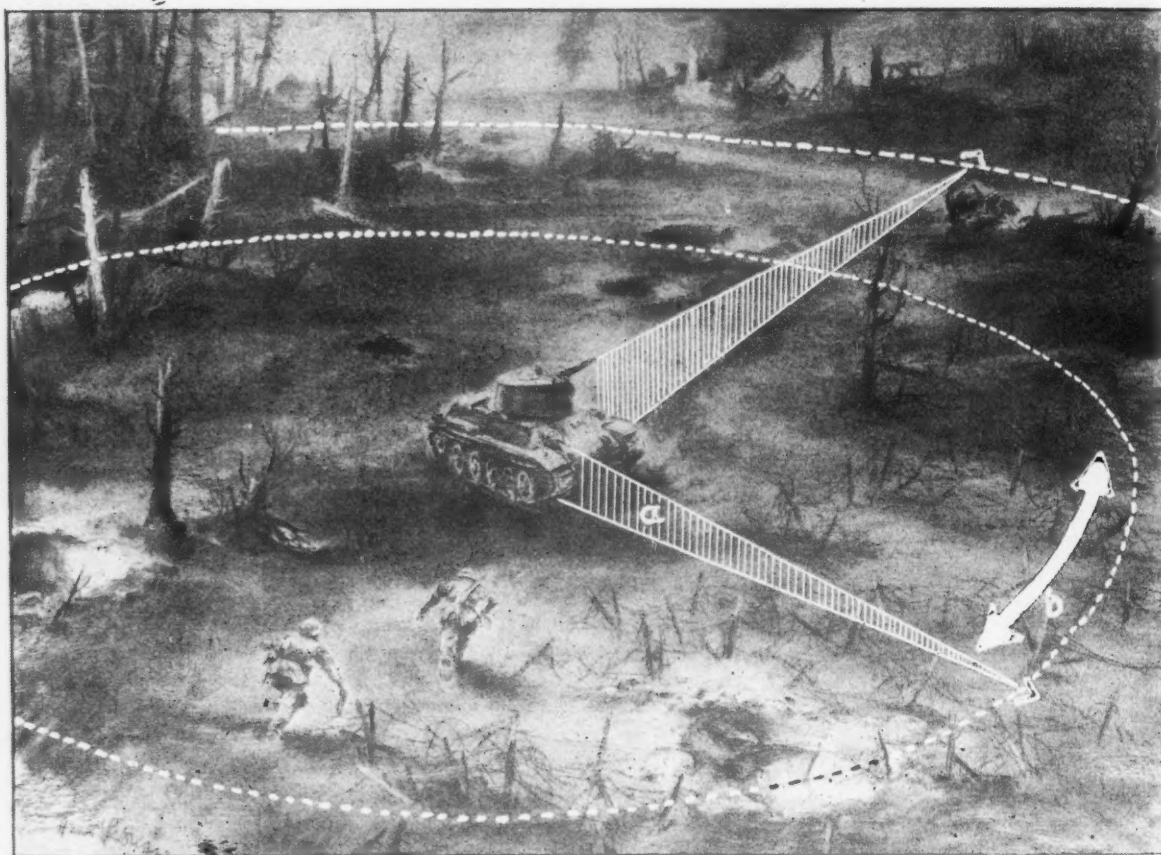
Neither did the combat fliers forget their comrades down below, defending the old flying field as infantrymen. Day after day they circled in the lonely sky seeking the enemy positions and dropping their bombs. But time and again the Soviets charged ferociously from four sides at once. Their dead in the forefield were counted by thousands. On one single day, light antiaircraft artillery belonging to the group knocked out eleven of the enemy's tanks, firing from open positions.

Then came the bitter news: the strategic situation on the central Don made the relief of the flying field impossible. It had to be abandoned. What was to become of the 2000 men who had defended it so bravely for a period of four weeks?

For three nights the transport planes of the group under Captain G. flew continuously. For four weeks they had supplied the combat group with ammunition, weapons, and food. Now they were removing from the abandoned field the men who were still alive. In the space of three nights, the second of which was foggy, they succeeded in removing the men. Heavy infantry and mortar fire from the Bolsheviks pressed the porcupine [hedge-hog type] formations together more and more and interfered with each of their landings and take-offs. When the next to the last Ju 52 plane landed, the porcupine formation of the Tyroller combat group was only about 100 meters in average diameter. The pressure of the Bolsheviks was becoming heavier and heavier. It would be impossible for the last plane, which was to take away the last load, to make a landing. Then a young lieutenant of a newly organized air force field division asked to be given the command over the last thirty men, giving as a reason that he was single while the older officer intended for the task was married. His request was granted.

The last transport, which a quarter of an hour later circled alone above the field, saw nothing more of the thirty men. Nineteen hundred and fifty-seven men had left the field; thirty remained with their lieutenant.

# Men Against Tanks—German Method



THE MACHINE GUN and cannon of a tank can cover a full circle horizontally by the rotation of the turret and the turning of the tank itself. But vertically the sweep of both guns is very limited and thus there results an "unprotected angle" downwards ("a" in sketch above) and consequently a "dead circle" (b) within which the tank cannot be protected by its weapons. Furthermore, the tank with its hatches and observation ports closed for battle has only slight possibilities of surveying its immediate vicinity through its narrow peepholes. The "tank hunter," therefore, allows the tank to approach as near as possible and then dives into the "dead circle" where defensive weapons are not effective.

In the sketch at the right the more vulnerable parts of the tank are indicated. The relatively thin top armor (A) is easily vulnerable to aerial bombs, and the underside (B) to powerful mines. The parts always aimed at by the "tank hunter" are the chain drive (C), the tracks (D), the peephole (E), the observation ports (F), the joint between turret and body (G), and the poorly protected motor (H).

Skilled "tank hunters" first throw smoke bombs at the tank which is thus blinded in a shroud of clinging, earth-brown smoke. By means of smoke screens laid between advancing vehicles, even tanks traveling in close columns can be isolated and deprived of mutual protection by cross-fire. Heavy disk mines are then thrown at the monster, shattering its treads, while old hands at the game are able to throw their disks right on the peep-hole or the motor, totally de-



stroying the tank. The machine gun can be put out of action by striking it with an iron rod, but the masterpiece of tank destruction is achieved when the "tank hunter" jumps on the rear of the tank and shoves his disk between the turret and the body, ripping the turret with its heavy cannon from its track and fastenings.

Today, every German grenadier is trained in this risky business, and is familiar with all the special weapons used in tank destruction.

—*Berliner Illustrierte Zeitung.*



# Ports of Embarkation

BRIGADIER GENERAL J. R. KILPATRICK, *United States Army*  
Port of Embarkation Commander

PORTS of embarkation are difficult to describe and hard to standardize. They *cannot* be standardized. A study of the New York Port would not solve the problems of the Port of San Francisco, although certain underlying principles are the same. Both in organization and operation, the Port of Hampton Roads differs from both New York and San Francisco. The only points of standardization of a port of embarkation are its duties and responsibilities. These are governed by War Department directive. The objective to be obtained—the job to be done—can be set forth. How to accomplish the necessary results is another matter, and depends on many varying conditions.

The duties of a port are divided into two main classifications: handling of troops and handling of supplies. The troops come from their home station into the staging areas, supposedly with no shortages of individual or organizational equipment. Each man's records are supposed to be complete, with allotments and insurance all in order. His medical records and inoculations should be complete. The organizational equipment of each unit is also supposed to be complete with no shortages. I say "supposed"—I detest the word. Nothing ever happens the way it is supposed to. Units come in from their home stations without having complied with the embarkation regulations, and some of them not even having read those regulations; but the fault is partly ours, because the regulations are so voluminous that it is expecting too much to ask a unit commander to read them. It is like trying to read the Bible and doing everything that it says. We must simplify and condense our regulations and put them in a more readable form if we expect compliance.

The men do not come in with their records in shape, so they must be checked. Nothing is so pitiful as a soldier arriving overseas with all his papers not in order. Records *must* be complete and exact. A showdown inspection at the staging area assures that he has every item of equipment—clothing, socks, underwear—suitable to the particular sector to which he is being sent.

Shortages of organizational equipment must be checked, and here is one of the most difficult tasks of a port. Organizations are supposed to pack their equipment at their home stations and send it to the port of embarkation properly packed, with packing lists in order and with weights and cubes correctly listed. Only thus can a port plan for cargo so that all the equipment of an organization goes on the

same ship with it, or at least in the same convoy. If this is not done, sometimes it is months after the organization arrives at its destination before its equipment arrives. An organization cannot function until it is equipped. An armored outfit with no tanks is worthless; hospital units need all their organizational equipment before they can operate. Ports must check to see that all equipment reaches the port, and in time. Much of it comes from the Chief of Services. Shortages at home stations are reported to the port, and the port must follow through to see that as items arrive in the port they are put aboard the proper ship, and all in the same convoy. Ports must check the condition of the men; take care of their dental work, if necessary; and replace them from the port replacement pool if physically unfit.

Our port replacement pools have not reached the stage where we can pick out a man in any category to take the place of a man who is disqualified and must be replaced. We will reach that stage in due time. Ports are also to check the status of training and take out men who have not had sufficient training or firing practice. This is difficult, due to the fact that our pool has not yet been brought up to a sufficiently efficient point of organization.

The next task of a port of embarkation, once an organization is embarked, is their automatic supply at their foreign base, and the supply of material requested on requisition.

A third main function of a port of embarkation is training. That may seem far afield, but such training ties in to the central work of the port. We train stevedores, port headquarters detachments, ship platoons, and small boat platoons. The need for stevedores is obvious, and the only way to train them is by actually having them load and unload ships. Many of the help that we use cannot read, so it is silly to draw up elaborate training schedules with reference texts. We teach by actually having them work with civilian stevedores, and infiltrate them into stevedore gangs as they work the ships. We made a carefully thought-out arrangement with the Stevedore Union, agreeing to use every available union man when the work required this. When the work was too great for the supply of available union labor, the union agreed that we could bring in soldiers. When the work slackened, the first men laid off were the soldiers. In that way the union stevedores are not working themselves out of a job. This plan has worked very well. The quick way to teach a man is to put him alongside an experienced worker.

Mobile Port Headquarters are trained for service overseas. The Ship Platoons are units of doctors and nurses who go aboard transports, expecting to bring wounded on the return trip. The normal ship's medical personnel are not able to take care of many wounded, so when a number are expected to come back, we will ship these doctors and nurses on a transport to wait at the base until it is determined what transport will bring back the wounded, and then the medical personnel are assigned to take care of them.

The operation of a port is difficult to describe. I told you there is no standardization of organization. That organization depends on conditions and facilities of each port. Each port has a General Staff Corps organization. We start with a General Staff Corps setup, then build up the different supply sections, Army Transport Service, Port Transportation Division, etc.

I will touch on the auxiliary units that a port needs. It needs port battalions of enlisted stevedores for training, and to help out when the load of work is more than the local supply of labor can handle. The port needs Quartermaster Labor Battalions to work in the warehouses when the load is heavy; the port needs a Truck Battalion, a Military Police Battalion to take care of embarkations, security, etc., a delousing unit for prisoners, and a laundry unit for the same purpose. The civilian laundries are not able to take care of the laundry needs when there is an embarkation. The men must be sent off with clean clothes; transports must have clean linen; and all this must be done very quickly. For that reason, a very elaborate and extensive laundry system must be established.

The physical setup of a port is obvious. Obviously, a port needs piers; rail facilities; storage warehouses; an adequate road net; staging areas; and ammunition back-up storage areas. The extent to which these facilities are needed depends upon the layout of the port itself. One type is a lighterage port. Most of its freight comes by rail, is transferred from rail to lighters, and the lighters are towed alongside and loaded aboard ship. Much freight comes in by trucks. A very small percentage of the freight is loaded directly from cars to ship.

At another port the opposite is the case. There freight comes in by rail, and not by truck. We have depressed tracks down the center of each pier, and we work directly from the cars to the ship whenever possible. This is a much more efficient method, and does away with lighterage and with double-handling.

When a car comes in, it can be spotted at the pier in from four to eighteen hours. That is impossible in a lighterage port. There the car has to be spotted and unloaded into a lighter. Then the lighter is towed to the ship, and the loading of the ship proceeds. At the other type port we work the other

way. The railroad yards should be immediately back of the merchandise piers, and we store our cargo on cars and move them onto the piers to load direct to the ship. We have apron tracks, so that freight cars with tanks, steel rails, or any heavy cargo can be handled directly into the ship. The car is spotted opposite the hatch in which the particular piece of equipment is to be loaded. This speeds up loading and does away with intermediate handling.

The foregoing comparison shows the difference in planning and organization between different ports, and that no two ports have standard or identical conditions.

The ammunition back-up storage area is not intended to be a depot of ammunition. The storage area is adjacent to the port and is used for overflow cargo—cargo that arrives too late, that is shut out. Ammunition is too dangerous to leave around the railroad yards, so we bring such cargo to the ammunition storage area where it is unloaded into igloos or else remains on the cars until the next ship arrives.

Changes in priorities are a headache to a port. Overseas calls for one-thousand-ton bombs, and the depot or rail transportation exerts every effort to secure them. As soon as the bombs arrive, somebody changes his mind, and wants something different, but the bombs are already in port. They must be sent back, or stored, and other bottom cargo substituted.

The amount of storage that is required is another difficult point to determine. For shortages of equipment quite a large amount of storage is required. Much is also required for overseas assemblies. We have to build up our cargo until we have enough to fill a vessel, and in the meantime that material must be stored in warehouses. Much storage space must be kept available for that purpose. Warehouse space must be kept for the port reserves and overseas supply reserves. Every service fights for port storage space.

A small port commander will fight to keep out large stocks of supplies that will use up storage space. A port is not a depot, and must not be used as one; a port is an agency of movement and the various services must not come in and take up its storage space. Let the regulating stations and holding-and-reconsignment points take care of the handling of banks of supplies. A port needs a certain back-log of cargo, rations, Lend-Lease supplies, etc., but these should not be allowed to get out of balance. Storage space should be reserved for the accumulation of supplies going overseas.

The equipment of a port depends upon the type of the port. One port requires a great many lighters and tugs. Another requires a few lighters, very few tugs. Cranes and heavy lifts are essential for loading tanks and heavy equipment. Lifts should not be loaded which cannot be unloaded at the point of destination. If a ship is going to a port where there



is no heavy lift equipment, everything must be loaded on the ship with the ship's gear, because if the ship's gear can load it on, it can take it off. Never use heavy lift equipment to load a ship unless there is corresponding equipment at the port of debarkation.

One other essential matter at a port is an extensive Motor Transport and Ordnance Repair Shop. This war is a war of vehicles. The movement of vehicles has increased strikingly from World War I. Before vehicles are shipped overseas, they must be carefully processed. Gasoline and water must be drained, all of the working parts must be greased, and exposed metal coated with rust-proof material. Many of the vehicles have to be hermetically sealed. This processing is necessary for tanks; and they must be treated at the port of embarkation because a vehicle cannot be run after it has been processed.

The Ordnance and Motor Transport shops are extensive. They operate on the assembly-line principle. The vehicles are washed, checked, and gone over at the port before they are put aboard ship. Every glass windshield is protected by wood. The electrical equipment is greased and protected with tape.

The processing of the vehicles has progressed greatly in the last two or three months. In the first shipments that were made to the Middle East, many of the vehicles were damaged when they arrived, because they had not been properly processed. That experience necessitated the plan of vehicle processing which is now used. After the arrival of the vehicles at their destination, the tape and grease are taken off, the gas, water, and oil put in, and they drive away from the pier under their own power.

The Overseas Supply Division is another new and distinctive set-up. The directives and instructions for handling overseas supply have not been definitely settled. It is a question whether an Overseas Supply Division of a port will be a staff function or an operating function. I feel it should be staff-directed, and that the operation of overseas supply should remain in the hands of the different supply sections of the port.

The Overseas Supply Division has responsibility for the automatic provision of Class I and Class III supplies and the furnishing of other supplies that are requisitioned. The Overseas Supply Division is in direct contact with the Commanding General of the base section of the services of supply overseas. Overseas Supply keeps a record of the level of supply at the base, tries to maintain the level authorized by the War Department, and edits requisitions that come in. This editing is an important and necessary function. It means that Overseas Supply has to go over carefully the requests that come in from overseas, and must see that the overseas base does not ask for more of any item than is authorized by the War Department directive. To carry out this plan, credits are set up in depots in the rear by the Chiefs

of Services, and the Overseas Supply Section calls on these reserves and creates and establishes priorities on shipment. Overseas Supply directs the supply sections in the port regarding the materials and time of their shipments. To make Overseas Supply an operating agency would duplicate the other sections in the port, and we would have two Quartermasters, two Engineers, and other unnecessary duplications. I would let the Overseas Supply exercise the staff control and have the port supply sections take care of the details and the detailed record keeping. That is, on all except one matter—the record keeping on the status of requisitions from overseas. The most difficult problem in any army supply system is keeping an accurate record of requisitions. A unit may send in a requisition for certain supplies which may not be available at the time the requisition arrives. After a time has passed, the unit will call for the item again. Confusion will result.

For example: in the last war, when the 26th Division was moving out of the lines at Chemin des Dames, it received twenty-six carloads of wagon parts. The division had requested these parts while in base camp in the United States, and since these items were not received, called for them again at the port, again in France, and whenever the Quartermaster thought of it he put in another requisition. The different orders all arrived at once as the division was moving out of the lines. These supplies were jammed up in a railhead and had to be sent back, because in the meantime the 26th Division had acquired the necessary wagon parts from some other source.

Maintaining an accurate record of requisitions is a most difficult task. A unit will ask G-4 where the requisition is; G-4 will ask the services of supply; the services of supply will wire back and ask what the status of a certain requisition number is; and there is general confusion and delay.

I think we have solved the problem of keeping a clear record of these requisitions. It is a machine record system under our Overseas Supply Division. When the division receives a requisition for overseas, and when it prepares these requisitions to go to the Chiefs of Services and to the depots, the requisitions are typed by an automatic machine which cuts a card for every item on the requisition. This operation takes no more time, because the requisition has to be typed anyway, but the machine will cut a card listing the class of supply, the depot, the service, the date, the unit, and all other data that must go on the basic requisition. These cards are then sorted in a machine, and the turning of a crank will automatically separate all items on any requisition or for a unit or class of supply. When the supplies are shipped from the depot, that fact is noted on a card, and the card is filed in another box. When the supplies arrive in the port, that card is punched to indicate this fact. When the supplies are



loaded, that information is entered on the card, together with the number of the ship. If you wish to know what happened to a certain item, you will find it on the card, all listed and arranged automatically.

The actual loading of ships, the cargo loading principles used, the necessity for full utilization of weight-carrying capacity of a ship and the space in the ship, these are vital factors, and we are making good progress in efficiently using cargo-carrying capacity.

During the early stages of the war the army was criticized for their loading of ships. But they cannot be criticized now. The present loading methods of the army compare most favorably with civilian commercial operations; in spite of the fact that we have to meet deadlines, shortages, and priorities that never confront commercial firms, our army loading record is good.

Sometimes we will be ordered to leave off bombs or some other items, and load gliders or airplanes, and this change in order will throw off weight and cubage calculations. But in spite of these difficulties, we have made progress and our loading statistics compare favorably with commercial figures.

The reverse operations of a port of embarkation are obvious; that is, the shipments of salvage, and the shipments of prisoners and wounded. The salvage is a function of the service command, and handling salvage is not a desirable type of work at a port. Salvage will clutter up a port; salvage depots should be located well to the rear and a minimum of sorting should be done at the port.

The handling of prisoners is another problem. They must be deloused, loaded on trains, and transported to their destination. At one port our merchandise piers have depressed tracks; we can put a train on the pier, bring the prisoners off the ship, search them and have them aboard the train in half an hour—a load with 300 to 500 prisoners in one-half hour.

The hospital trains are not really trains, but a unit of three cars. When we begin to handle large numbers of wounded, we will not have enough trains to take care of them. We will have to use standardized Pullmans, having one hospital car in each train. At our port, we have worked out a plan of loading through Pullman windows. We can load all the wounded through windows on stretchers by means of a chute; that is, all except those with arms or legs in a cast or protruding at an angle. Those wounded will have to be loaded in hospital cars which have a side door to receive a man on a stretcher. We can load a hospital train in thirty minutes. The wounded should not be kept at the port; they should be put on a hospital train and removed to a hospital in the interior.

The danger points in operating a port of embarkation are only two. First is congestion—rail congest-

tion. In the last war, the ports of this country were so badly jammed with freight that cars could not be moved and unloaded. At certain ports, cargo that was on the piers had to be sent out just to be rid of it. That was one time we learned our lesson, and a system of control was set up. At the ports a system was established under which no shipment of more than one car could be made to a port of embarkation without a release. The port commander can stop a shipment, and a shipment cannot be forwarded unless he releases it. This system is working very well; so far, our ports have not been congested. The freight comes in only as space or ships are available at the port. Strict control is needed to keep this system in operation. Manufacturers want to get rid of supplies and send them to the port, and we cannot let that happen.

The overloading of labor is a second danger. The present system of convoying necessitates large numbers of ships going over together. It means that they must all meet certain deadlines. This puts a great burden on the different ports. This situation is difficult, but it must be put up with. After a convoy leaves, we may not have a single ship loading and stevedores are idle. Then we get many ships to load at one time, and we have not labor enough to do it. Thus, the present convoy system throws a heavy load on our ports.

Cooperation with the navy is a vital factor. Our relationship has been splendid; we have helped them and they have helped us in every case. This was particularly true during the movement of the-----, which went to Africa. We loaded a certain number of the ships, and they loaded others. We never had misunderstandings, and the whole operation went over very well.

Combat-loading is one of the most interesting but most complicated problems that we have. In convoy loading, which is comparable with commercial loading, the idea is to put as much cargo in each vessel as you can, and plan it for the maximum efficiency of loading. Combat-loading discards that principle. The Task Force Commander or the Commander of the Combat Team on a ship has to give first consideration to his landing operations. The first troops ashore have to establish the beach-head; the next ashore will be the vehicles, the tanks, the personnel carriers, the AA guns, the 105's, 155's—whatever the troops need to carry out the tactical mission. The equipment has to be so loaded that the first thing off is the last thing loaded aboard, and that reverses our usual procedure. Then the ammunition, engineer supplies, and signal equipment that will be needed in conjunction with the landing operations have to be available. In the African movement we loaded each vehicle for combat. Every vehicle that went aboard had gasoline, was fully loaded with ammunition for the weapons that were in the vehicle, and had a certain amount of emergency rations. The ve-

hicle had its crew, gasoline, oil, rations, ammunition—everything that the crew needed was actually in the vehicle. That necessitated an interesting treatment of the vehicle. In landing, going through the surf, the surf might break over the vehicle, so they all had to be waterproofed. The exhaust was carried by a hose over the top, so that with this system of waterproofing, a jeep could run in deep water for a short distance. The vehicle could not go very far, but could go a certain distance. Half-tracks, jeeps, trucks, and tanks all could go through the water. The exhaust and air-intake of our tanks were carried up on the back of the tanks with sheetmetal gadgets which could be dropped by a series of levers after landing.

All of those details had to be thought out. Then the rations had to be stored in such a way that they were available in the order that the Combat Team Commanders wanted them to go ashore, and the same with the ammunition. As it was essential to have so many units of fire for all of the vehicles on the ship, the ammunition had to be divided so that

if one ship went down, those remaining had the ammunition the troops would need.

The combat-loading was worked out by the Amphibious Force, but the difficulty was that each Combat Team Commander changed his mind as to the composition of the units to be on each ship, the amount of ammunition, the number of tanks, the number of half-tracks. And they made one mistake—they put on too many combat vehicles instead of general purpose vehicles. We did not have enough trucks to do the job. I am sympathetic with the Tactical Commander, but once the landing is accomplished, the trucks become valuable, and vital, and we need general purpose vehicles.

May I now leave you with one thought: When figuring on the operation of a port of embarkation, do not try to standardize. Use existing civilian facilities to the utmost; take over existing organizations as they exist, whether they be here or abroad. Start with that, and you can simplify your task. Do not let them ship the equipment at you too fast, for congestion kills efficiency. A port is an agency of movement—keep it fluid.

## In the Spirit of Their Ancestors

[Translated and digested at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Die Woche* 10 March 1943.]



THE JAPANESE BOY looks forward to the moment when, at the age of six, he will hold in his hand for the first time the wooden sword which is the emblem of his earliest manhood. This weapon of his knightly ancestors, the legendary Samurai, will accompany him throughout the rest of his life although it will be many years before he will be able to exchange the wooden sword for one of tempered steel.

He first learns to wield his wooden sword against his comrades, similarly armed. This broad-sword fighting is called "ken-do," the last syllable involving a sense of that exemplary military attitude which from this time on is to govern the boy's whole life. He is inspired with this military attitude in many ways, through training in self-defense ("ju-do"), in archery ("kyu-do"), in many sorts of ancient and modern exercises and military games, and not least in the peculiar moral instruction of the schools which teaches him to heed and follow the customs of his people.

With the advent of young manhood, there is placed in his hands the razor-edged sword of the Samurai—that wonderful weapon, often handed down through many generations, which will cut through a sheet of tissue paper without making a sound and, with a well-executed swing, will cut clear through a straw-encased bamboo pole comparable in resistance to the human body. So thoroughly united does he finally become with the easily-flexed sword in the lacquered sheath that today he frequently carries it along with traditional pride in the tank, plane, or submarine, indifferent to death as were his ancestors.

The young Japanese engages in the most varied forms of sport. Baseball, for instance, is a great favorite. New methods of physical training are sought with a zeal equal to that with which traditional exercises are engaged in. Not only individual training but training in teamwork is required.

The illustration shows young Japanese zealously engaged in stick-fighting in preparation for the sword-fighting which will come later. Officers closely supervise every aspect of the action, especially the fighter's form. This man-to-man fighting with the stick grasped as a Samurai sword requires the quickest kind of action.

# Division Command Post SOP

LIEUTENANT COLONEL DILLMAN A. RASH, *Quartermaster Corps*  
Instructor, Command and General Staff School

*For the benefit of readers who are not acquainted with the abbreviations used in this article, there is a supplement at the end which shows all the abbreviations used herein and their meanings.—THE EDITOR.*

IT IS just as true today as it was in 1863 that a "General's headquarters is always about three feet north of his hindquarters," that the true "post of command" of a unit is wherever that unit's commander happens to be. But because of the diversity and complexity of the job of directing all phases of operation and administration, commanders now have staffs to do their "pick and shovel" work. And in the case of the infantry division this staff amounts to more than 50 officers and warrant officers and 250 enlisted men. Obviously, such an entourage cannot accompany the General on a reconnaissance in a jeep to a forward artillery OP or go along in a liaison plane for a front-line flight. Moreover, there must be some point, known at all times to the division, to which all units have communication and at which detailed staff operations can be conducted. Consequently, we have the "Division Command Post."

In rear areas, the CP will be a rather extensive installation, with all of the General and Special Staff Sections in easy reach of the Chief of Staff; in a mobile battle, the CP must be a small group of staff officers and enlisted men, with all personnel not essential for conduct of tactical operations well to the rear. So, in determining the composition, transportation, equipment, and internal administration of the Command Post under all of the varying conditions which may arise, there must be the utmost of flexibility, of adaptability, and of ingenuity on the part of the responsible staff officers. At the same time, movement, establishment, and physical operation of the CP under all circumstances must be well ordered and smooth so that there is a minimum of interruption to staff and command functioning.

The Staff Officers' Field Manual assigns to G-1 the planning for and supervision of "internal arrangement of headquarters"; to the Headquarters Commandant, "local security of headquarters" and "internal administration and arrangements for moving headquarters." These two officers are therefore deeply concerned with the development of a flexible plan for Command Post procedure—and in most units this "plan" has taken the form of Standing Operating Procedure for Command Post Movement Establishment and Operation. These SOP's are usually de-

tailed and voluminous in newly formed divisions—and this is not objectionable since members of the Staff Sections and Division Headquarters Company are untrained and need specific step-by-step instructions. A detailed SOP is also helpful in informing new staff members of CP operation. Of course, a trained headquarters group needs no written SOP—their habitual or instinctive procedure is "SOP"—so that long-winded documents can gradually be discarded as training proceeds.

Any SOP, no matter how carefully and thoughtfully prepared, must be considered "Tentative Only" until it is tried out on the ground under simulated combat conditions and there should be no hesitancy in making changes and revisions. Moreover, every Division Commander and every Chief of Staff has his own ideas, so that an SOP that "worked like a charm for my outfit" may require radical change for any other.

The following Command Post SOP has been developed as a compromise between the few succinct indications necessary for a well-trained staff and the volumes containing detailed instructions on everything including the dimensions of individual foxholes.

## STANDING OPERATING PROCEDURE INFANTRY DIVISION COMMAND POST OPERATION AND MOVEMENT

1. In the field, DHQ will be divided into a Fwd Ech and a Rr Ech. These will normally be subdivided into a total of four operating Gp's as indicated below. However, extreme flexibility must be the keynote of all Command Post Operations and the situation will govern not only the location but also the composition of each Gp.

### a. Fwd Ech:

- (1) Div Comdr Py:
  - (a) CG and ADC.
  - (b) G-3 or representative.
  - (c) Arty representative (on occasion).
  - (d) Rad Opr(s).
  - (e) Armed escort.
  - (f) Two vehicles.

This is a Mbl Gp, operating out of the Adv Msg Cen during Mbl Opns and returning to the CP during planning phases or when action has stabilized.

- (2) Adv Msg Cen:
  - (a) 1 O and necessary EM and equipment



# DIVISION COMMAND POST SOP

from Sig Co to install and operate necessary Coms.

This installation will be as far Fwd as conditions will permit. It will be connected by wire to the Div CP and by Rad with the Div Comdr (as directed). Fwd units will be informed of its location.

## (3) Div CP:

- (a) CG and ADCs (on occasion).
- (b) Asst Div Comdr and ADCs (on occasion).
- (c) Div Arty Comdr (or representative) and minimum Stf.
- (d) C of S and 4 GS Secs (— Dets).
- (e) Air Support Py.
- (f) CWS Sec.
- (g) Sig Sec (— Dets).
- (h) Engr Sec (—).
- (i) Ln Os from Inf Regts (or CTs), Rcn Tr, and Atchd C units.
- (j) Hq Comdt.
- (k) PM.
- (l) Det DHQ Co.

## (4) In the vicinity (from 1/4 to 1/2 mile distant) but not a part of the CP proper will be:

- (a) Hq and Hq Btry Div Arty [less Pers in (3) (c) above].
- (b) Div CP Mtr Pool.
- (c) DHQ Co (— Dets) (incl O and EM messes).
- (d) Sig Co (— Dets).

## b. Rr Ech (in Division Service Area—Annex No. 3).

- (1) G-1 and G-4 Secs [less Pers in (3) (d) above]
- (2) AG Sec.
- (3) IG Sec.
- (4) JAG Sec.
- (5) Fin Sec.
- (6) Sp Serv Sec.
- (7) Ch Sec.
- (8) Med Sec.
- (9) QM Sec.
- (10) Ord Sec.
- (11) Adm Cen (Unit Pers Secs).

## 2. a. Each Ech will have Dets from the Sig Co, the MP, Sp and T Plats of DHQ Co, and Mbl Aid Stas as provided by Div Surg from Med Bn.

## b. For Pers and vehicles of Secs organically a part of DHQ and DHQ Co, see Annex No. 1.

## c. Pers and equipment of Ord, Engr, Sig, QM, Med, Unit Pers Secs and Ln Os will be furnished by organic units.

## 3. a. Unless designated by higher Hq, general location of Div CP (Fwd Ech DHQ) will be designated by G-3.

## b. Selection of actual site and internal arrangements of DHQ are functions of G-1, assisted by Hq Comdt and Sig O. The facility of Coms will be the governing consideration.

## c. For "normal" ground plans, see Annex No. 2a.

## d. Each Sec is charged with the responsibility of unloading, setting up, dismantling, and loading its own equipment. Each Sec will dig protective foxholes for all Sec members promptly on occupation of a position, and will maintain continuous and strict camouflage discipline of its area.

## e. All passenger vehicles arriving at the CP will halt at the "passenger dismount Pt" and all Pers will walk into the CP. Parking areas will be established by the Hq Comdt for:

- (1) Vehicles not in current use, and
- (2) Vehicles currently in use, including visitors. Drivers of vehicles of the second class will be instructed by Gd at "dismount Pt" to Prk vehicles in prescribed area and return to "drivers' assembly area" (near Tp in Mtr Prk).

## f. Hq Comdt will provide for all-around security for CP from ground and A Atk by:

- (1) Posting of sentries to give warning of A, Mecz, or gas Atk.
- (2) Development of alert plan with posts for each O and EM of Fwd Ech.
- (3) Coordination with G-3 for selection of additional units for CP protection.
- (4) Warnings for Atks:
  - (a) A—3 short siren blasts.
  - (b) Mecz—2 short siren blasts.
  - (c) Gas—rapid beating of iron triangle.
  - (d) All clear—1 long siren blast.

## 4. MOVEMENT.

### a. Fwd Ech DHQ will displace by Ech.

### b. Notice of a contemplated move will be given by the C of S, at the earliest possible time, to the Adv Py of Fwd Ech, which will consist of G-1, Hq Comdt, Sig O, Det Sig Co, Det DHQ Co and representatives of each Stf Sec. The Adv Py will move immediately to the designated area, select exact site and set up the CP.

### c. When the installations have been completed at the new location, the C of S will be notified. The CP will then, on his O, open at the new location, and close at the old site at the same hr. The remainder of the Fwd Ech will then move to the new CP. T will be pooled for this movement.

### d. All Os, NCOs, and drivers will be notified of their destination and route thereto prior to movement.

### e. Movement by infiltration or 5 vehicles per mi.

### f. Subordinate and higher Hq and the Rr Ech

DHQ will be notified regarding change of location of the CP.

### 5. THE RR ECH, DHQ.

- a. The Div AG is in charge of the Rr Ech DHQ which will include the Div Adm Cen. His duties in establishing, operating, and moving the Rr Ech are similar to those prescribed herein for the Hq Comdt for the Fwd Ech.
- b. For "normal" ground plan, see Annex No. 2 b.
- c. The Div AG will furnish Pers from the Div Adm Cen for the DSA Res as directed by CO, DSA.
- d. Time of movement and location will be prescribed by the CO, DSA.
- e. Pers of Div Adm Cen will be Atchd to units in the DSA for rations. T for their movement will be furnished by the Div QM. T will be pooled for this purpose.

Annex No. 1 —Pers and assigned T, DHQ, & DHQ Co (— MP Plat).

Annex No. 2a—Schematic Diagram, Fwd Ech, DHQ.

Annex No. 2b—Schematic Diagram, Rr Ech, DHQ.

Annex No. 3 —Schematic Diagram, DSA.

### ANNEX No. 1

#### Personnel and Assigned Transportation, DHQ and DHQ Co (— MP Plat)

Section	Personnel				Transportation				
	O	WO	EM	Total	Trk, ¾-ton, Comd	Trk, ¼-ton	Trk, ¾-ton, Wpn Carr	Trk, 1½-ton, Cargo	Tlr 1-ton
<b>FORWARD ECHELON:</b>									
CG.....	3		2 <sup>a</sup>	5	1 <sup>s</sup>				
Asst Div Comdr.....	3		2 <sup>a</sup>	5	1				
C of Sec.....	1	1	2 <sup>a</sup>	4	1				
G-1 Sec (—).....	1		3 <sup>a</sup>	4	1				
G-2 Sec.....	2		7 <sup>a</sup>	9	1				
G-3 Sec.....	5		13 <sup>a</sup>	18	2	3			
G-4 Sec (—).....	2	1	4 <sup>a</sup>	7	2				
CWS Sec (—).....	1		4 <sup>a</sup>	5	1				
Hq Comdt & Hq Co	2		25 <sup>a</sup>	27	3 <sup>p</sup>		1	2	2
Total Fwd Ech.....	20	2	62	84	13	3	1	2	2
<b>REAR ECHELON:</b>									
GS Secs (1 & 4).....			2	2					
AG Sec.....	5	3	33	41					
CWS Sec.....	1		1	2					
IG Sec.....	2	1	3	6					
JAG Sec.....	2	1	2	5					
Fin Sec.....	2	1	17	20					
Ch Sec.....	2		3	5					
Sp Serv Sec.....	2		6	8					
Hq Co.....	1	2 <sup>b</sup>	84 <sup>b</sup>	87	2 <sup>p</sup>		3	2	5 <sup>c</sup>
Total Rr Ech.....	17	8	151	176	2		3	2	5
Totals.....	37	10	213	260	15	3	4	4	7

<sup>a</sup> Incl driver from T Plat.

<sup>b</sup> Incl Band.

<sup>c</sup> Incl 3 Trks, ¼-ton.

<sup>p</sup> Mtr Pool vehicles.

<sup>s</sup> Sedan.

(Note: Other Secs will obtain Pers and T from their organic units.)

It cannot be emphasized too strongly that SOP must be tested by actual operation—as soon and as frequently as possible. Staff officers must become used to operating outside of comfortable offices, without every convenience; once a file of papers has been scattered by the wind, no other hint is necessary that documents be reduced to the minimum. Annex No. 1 could be supplemented by additional columns showing operating equipment (typewriters, field desks, gasoline lanterns) assigned to each Section. The Headquarters Commandant must become proficient in the selection of CP sites under varying terrain conditions, the prompt assignment of areas, the development of defensive plans, and the supervision and execution of camouflage and other passive defense measures. Likewise, G-1 should develop a technique of supervision, which must be exercised continually. Enlisted personnel must become so accustomed to setting-up, camouflaging, and tearing down installations that they can do it smoothly, quietly, and efficiently at 0230 blackout in a driving rain. Some units, during their cantonment training period, have gotten excellent experience in CP procedure, by operating Division Headquarters, both forward and rear echelons under field conditions for several 7-day periods, with daily changes of location.

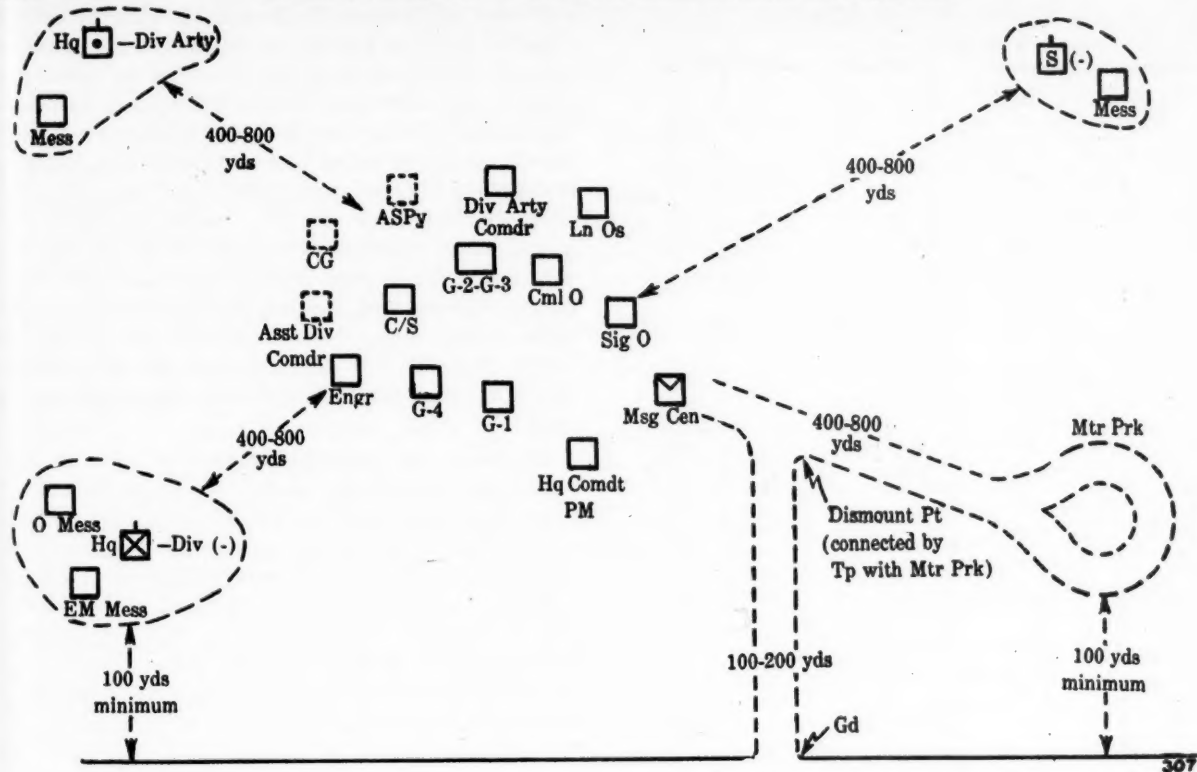
Extreme flexibility is inherent in our SOP and actual operations may well result in further changes. As to assignment of personnel (Par. 1, SOP), an operating staff might be set up for the Assistant Division Commander when he is sent out on a command job. The G-1 and G-4 Sections might be put in the Rear Echelon, with the Section Chiefs making frequent visits, in anticipation of issuance of orders, to the Forward Echelon. Special Staff Officers in the Rear Echelon, who have no worthwhile functions in combat, may be designated and employed as additional liaison officers.

In the execution of a Command Post SOP it must be kept in mind that the Forward Echelon of Division Headquarters is *not* an administrative installation. Heavy tentage, equipment, and transportation *must* be limited to *actual* needs; officers and men are prone to collect all manner of junk—personal comforts and conveniences and gadgets for CP operation. Such tendencies must be stopped before luxuries become necessities. On the other hand, there are many ingenious modifications of present equipment which can be made in the interest of more efficient CP operation. The "igloo" type tent, forerunner of the present CP tent, was a

# DIVISION COMMAND POST SOP

ANNEX 2a.

Schematic Diagram—Forward Echelon Division Headquarters



NOTE:

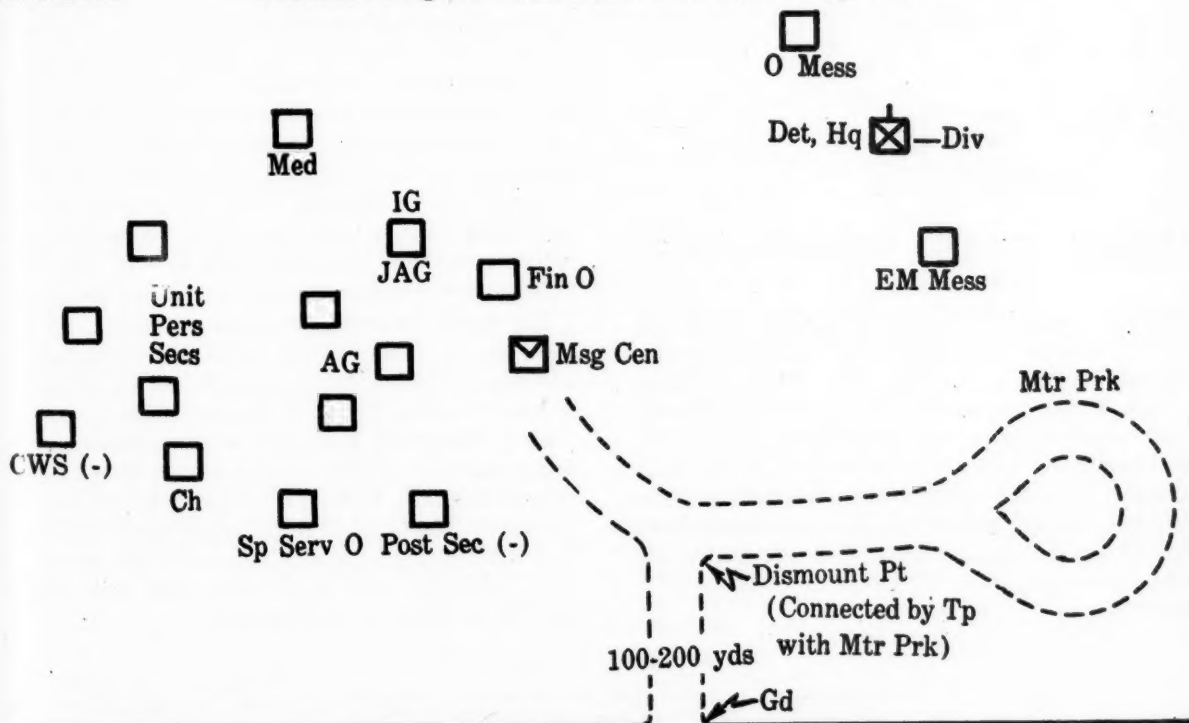
1. Minimum interval between individual installations 50 yds.

2. All vehicles except CP Trks unload at dismount Pt and move to Mtr Prk.

3. All installations camouflaged and under cover if available.

ANNEX 2b.

Schematic Diagram—Rear Echelon Division Headquarters \*



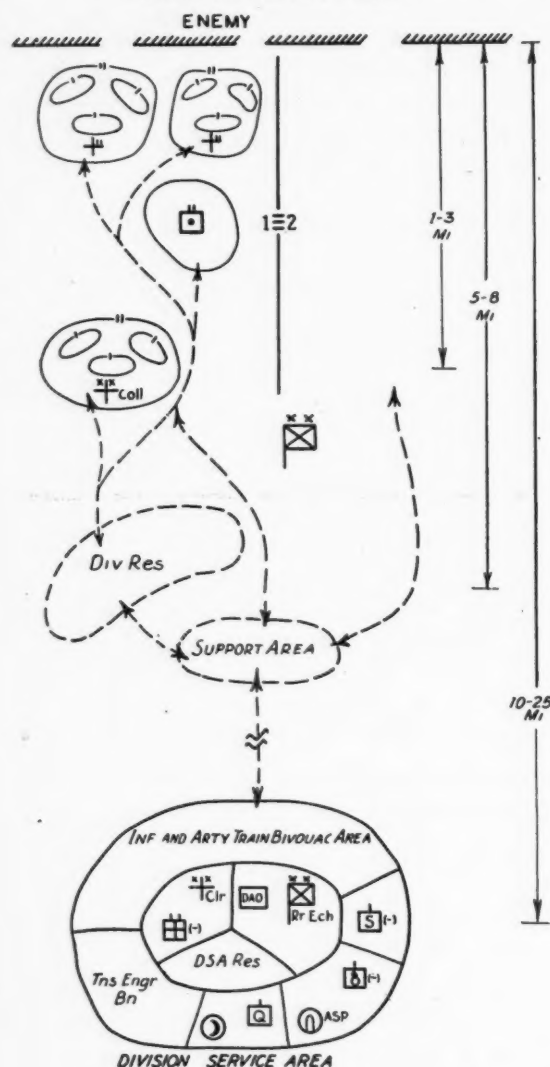
NOTE:

Minimum distance between individual installations—50 yds. All vehicles unload at Dismount Point and move to Motor Park.

\* Centrally located within Division Service Area (see Annex 3).



### ANNEX 3. Division Service Area \*



NOTE:

\* A discussion of "Service Areas of the Infantry Division" by Colonel Dean S. Ellerthorpe appeared with the above diagram in the MILITARY REVIEW June 1945.

worthwhile adaptation and advantage could be taken of modern manufacturing methods to develop a CP trailer to take the place of three or four of our "normal" individual installations. As to smaller items of equipment, there has been developed a desk which folds to "packing box" size and yet is much handier than the folding table it replaces. But all innovations must be viewed from the coldly critical standpoint—"Will this enable the Staff to perform more efficiently, or is it really a luxury?"

Some sort of uniform CP ground arrangement, as indicated in Annexes No. 2a and 2b, with the CG and Chief of Staff flanked on one side by the Sections concerned with Operations, on the other by those concerned with Administration, has been found helpful. Installation is expected, and locations can more readily be found under blackout conditions. Sleeping areas should be assigned, either small areas for each Staff Section near Section working quarters, or larger areas removed from the CP proper for officers and enlisted men. Such larger areas are taped off so vehicles and passing personnel will not disturb resting men. Messes must be set up 400-800 yards from the CP since, despite the best secrecy discipline, men (and officers) will congregate around food.

Emphasis on protective measures such as foxholes and camouflage seems picayunish but we all know that many units are as yet *not* perfect on these scores. The proper concealment of all Division Headquarters installations is a responsibility of the Headquarters Commandant; the Division Engineer can render valuable technical advice. From the initial reconnaissance of the proposed CP location, through its occupation and operation, camouflage discipline will be continuous and strict care will be taken that the existing terrain or cover is not disturbed, and that no personnel or vehicles walk or drive across-country where tracks will show. Dummy CPs, one or two miles from the actual location, have proven worth while, albeit temporary means to divert the attention of enemy air. Dispersion is indicated in all locations, but particularly in flat open terrain, such as the desert. Frequent "dry runs" in setting up the CP, with "before" and "after" air photos, are essential to insure that camouflage (1) becomes habitual and (2) is effective. As each Section is charged with providing its own foxholes, so is each Section responsible for camouflage of its particular installation. The Headquarters Commandant coordinates the entire camouflage plan and takes care of all CP installations not chargeable to a particular Section.

The words "training," "practice," "dry runs" have occurred frequently in the preceding paragraphs—and the actual events must occur just as frequently if your Division CP is to operate efficiently in the field. A Command Post SOP is quite helpful in the development of smooth operation—but should be considered a guide, sufficiently flexible to fit changing situations. Moreover, it must be subjected frequently to critical study so that Command Post procedure and techniques will keep pace with and support modern methods of making war.

## KEY TO ABBREVIATIONS

Authorized in *Field Manual 21-30*. Those marked with asterisk (\*) not authorized but generally recognized throughout the service.

A Atk(s).....Air Attack(s)  
ADC.....Aide-de-Camp  
Adm Cen.....Administrative Center  
Adv Msg Cen.....Advance Message Center

Adv Py.....Advance Party  
AG (Sec).....Adjutant General (Section)  
Arty.....Artillery  
ASP.....Ammunition Supply Point

AS Py \*.....Air Support Party  
Asst Div Comdr.....Assistant Division Commander  
Atchd.....Attached

## DIVISION COMMAND POST SOP

Atchd C.....	Attached Combat (units)	EM.....	Enlisted man (or men)	NCO.....	Noncommissioned Officer
Atk(s).....	Attack(s)	Engr.....	Engineer	O.....	Officer or Order(s)
Bn.....	Battalion	Engr Sec.....	Engineer Section	Ord (Sec).....	Ordnance (Section)
CG.....	Commanding General	Fin (Sec).....	Finance (Section)	Pers.....	Personnel
Ch (Sec).....	Chaplain (Section)	Fwd.....	Forward	Plat.....	Platoon
Clr.....	Clearing (Station — Medical)	Fwd Ech.....	Forward Echelon	PM.....	Provost Marshal
Cml O.....	Chemical Officer	Fwd Ech DHQ.....	Forward Echelon Division Headquarters	Prk.....	Park
C of S.....	Chief of Staff	G-1.....	Assistant Chief of Staff for Personnel	Pt.....	Point
Coll.....	Collecting (Station — Medical)	G-2.....	Assistant Chief of Staff for Military Intelligence	Py.....	Party
Comd.....	Command	G-3.....	Assistant Chief of Staff for Operations and Training	QM (Sec).....	Quartermaster (Section)
Coms.....	Communications	G-4.....	Assistant Chief of Staff for Supply	Rad.....	Radio
CP.....	Command Post	Gd.....	Guard	Rad Opr.....	Radio Operator
CT.....	Combat Team	Gp.....	Group	Rcn Tr.....	Reconnaissance Troop
CWS (Sec).....	Chemical Warfare Service (Section)	GS (Sec).....	General Staff (Section)	Res.....	Reserve
DAO *.....	Division Ammunition Office	Hq.....	Headquarters	Rr Ech.....	Rear Echelon
Det(s).....	Detachment(s)	Hq Btry Div Arty.....	Headquarters Battery Division Artillery	S.....	Signal
Det DHQ Co.....	Detachment Division Headquarters Company	Hq Co.....	Headquarters Company	Sig Co.....	Signal Company
Det Sig Co.....	Detachment Signal Company	Hq Comdt.....	Headquarters Commandant	Sig O.....	Signal Officer
DHQ Co.....	Division Headquarters Company	IG (Sec).....	Inspector General (Section)	Sig Sec.....	Signal Section
Div.....	Division	Inf (Regt).....	Infantry (Regiment)	SOP.....	Standing Operating Procedure
Div Adm Cen.....	Division Administrative Center	JAG (Sec).....	Judge Advocate General (Section)	Sp and T Plats.....	Special and Transportation Platoons
Div Arty Comdr.....	Division Artillery Commander	Ln O.....	Liaison Officer	Sp Serv Sec.....	Special Service Section
Div Comdr.....	Division Commander	Mbl Aid Sta(s).....	Mobile Aid Station(s)	Stf.....	Staff
Div Comdr Py.....	Division Commander Party	Mbl Gp.....	Mobile Group	Stf Sec.....	Staff Section
Div CP.....	Division Command Post	Mbl Opns.....	Mobile Operations	T.....	Transport or Transportation
Div CP Mtr Pool.....	Division Command Post Motor Pool	Mecz.....	Mechanized	Tlr.....	Trailer
Div Surg.....	Division Surgeon	Med Bn.....	Medical Battalion	Tn(s).....	Train(s)
DSA.....	Division Service Area	Med Sec.....	Medical Section	Tp.....	Telephone
DSA Res.....	Division Service Area Reserve	MP.....	Military Police	Tr.....	Troop
Ech.....	Echelon	Msg Cen.....	Message Center	Trk.....	Truck
		Mtr Prk.....	Motor Park	Unit Pers Sec.....	Unit Personnel Section
				WO.....	Warrant Officer
				Wpn Carr.....	Weapon Carrier

## Offensive Power and Limitations of Tanks

The tank is one of the offense's answers to the machine guns, entrenchments, and obstacles of the defense. It has an interesting combination of powers and limitations.

Speed is its most important characteristic, and this is limited less by mechanical considerations than by shocks that the crew can endure when traveling over rough terrain, even when an efficient spring suspension is provided. The tank can negotiate very rough terrain. Only such serious natural obstacles as deep streams, marshes, mountains, deep sand or mud, and dense woods of large trees will stop it. Narrow trenches and wire entanglements are no obstacle. They can destroy by gunfire or can ride over and crush a machine gun or other weapon in an open emplacement.

The limitations of the tank are many and serious. These are being reduced by improvement in design, but they can not be entirely overcome. A tank is conspicuous and very noisy, and so attracts attention and makes a good target. Visibility from the interior is relatively poor. It is deaf. The noise inside a tank

is so great that outside noises can not be heard. It is vulnerable to gas attack. It consumes fuel rapidly, and its radius of action is thus limited. It is subject to all the ills of an engine and maintenance requirements. The conditions in the interior are such that its crew is subject to strain and fatigue. To be effective, tanks must be employed in large numbers, and they are exceedingly expensive to maintain and replace. Moreover, the development of more and better antitank weapons can be confidently expected.

If obstacles are properly constructed and sited, the tank has no place in the final attack on a prepared position. Artificial obstacles include traps and barricades, thick vertical walls, deep shell craters, posts of cement or common steel rails set in the ground, abatis (tree branches) interwoven with barbed wire which clog the tractor points, mines, and simple well-dug trenches. When trenches are the proper depth and width they tilt the nose of the tank to the floor of the ditch and face it with an opposite vertical wall which cannot be climbed. This

latter type is very economical to construct as it requires no more tools than a pick and shovel.

Tanks in the attack are given successive objectives and when hostile resistance at each objective is subdued, they reorganize and prepare for further employment. They should not be tied too closely to foot troops. If so restricted, their mobility is sacrificed and they become vulnerable targets for antitank weapons. In the attack, tanks are dispersed in depth. The first echelon is supported by artillery and combat aviation and has the mission of destroying hostile antitank guns. The next echelon is composed of the tanks which accompany or immediately precede the other attacking units. The mission of this echelon is to overrun the hostile position and destroy fire just prior to the arrival of assault troops. It is desirable to engage reserve areas and forward areas simultaneously in a depth of 2,000 yards or more. If this is successful, a breakthrough of the defensive position may be achieved.—(From "Hell-Buggies" and the Engineer" in *The Military Engineer* March 1943.)

# At a German Command Post in Russia

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Captain Max Wartbiegler, German Army, in *Völkischer Beobachter* 5 April 1943.]

AT THE extreme southwest end of a large village surrounded by low, bare hills, some small, unpretentious mud huts lie to one side of the snow-covered highway. Only a few of them have complete straw roofs.

Around one of these pitiable hovels an alert sentry paces methodically. In the course of hours he has beaten a path in the knee-deep snow. Otherwise, no command post flag, no placard, not even a chalked inscription indicates that in this little building is the *command post of a corps general staff*.

The officer who asks the direction is scarcely recognizable as such, because the shoulder straps of his great overcoat are missing and his head-protector is pulled over his cap. He enters a small empty room. In the semi-darkness it can be seen that the floor is covered with manure, and some straw is scattered in the corner. It is that half of the dwelling which, as customary in the region, serves as a stall. At the rear, another door, half falling from the hinges, leads to the outside. A third door, lower than the others, opens into a small room.

Along the wall between two little windows—just large enough for one to stick one's head out in an emergency—stands a miserable table, and spread out on it the usual map with its many symbols: lines, circles, arrows, tactical symbols, and numbers. At the table sits the commanding general. The consciousness of confronting an almost insoluble problem weighs heavily upon him. The life or death of thousands of men is entrusted to him in these days. After a summer in which his troops stormed on from victory to victory, after an autumn in which strong resistance brought success after success, the god of war has now given him the most difficult test. This time, too, his corps is involved in an encirclement battle, but not, as formerly, as the tightening lever of an encircling brazen pincer. This time it is itself fighting for space, for freedom of movement, because this time the corps has been encircled and must now fight its own way out to freedom.

Alongside the commander, on one end of a bench serving two or three others as a seat, sits the chief of staff. He also is not disturbed by the new arrival. A hasty glance and a brief greeting, then he continues silently measuring the map, studies the combat-strength figures of regiments and battalions and the number of guns and antitank units, compares them with the hostile forces, makes sundry calculations on the margin of the map, and finally speaks a few words to his general. They are not considerations of the probable course of simple march movements

or combat activities of the usual sort, but concern the fate of many thousands of fine German soldiers.

The men outside have no knowledge of the seriousness of the situation. They know nothing of the encirclement, nothing of the iron ring of hostile tanks, guns, antitank weapons, and machine guns. For the most part, the noncommissioned officers likewise lack insight into the situation, and it is good that it is so. The troops fight as they are ordered, they attack and defend in the manner and place their leaders demand, and they should go about their hard, bloody work with minds as untroubled as possible.

From an old bedstead standing in the corner and serving as a bench, map table, and document and clothes repository all in one, an administrative officer rises, lays aside his maps and documents, approaches the newcomer circumspectly and answers in a low voice the questions directed to him.

The coming and going in the little room continues. Division commanders and general staff officers present the tactical situation of their commands; officers, runners, and various others inquire about their commands, about routes, about the enemy—and each receives answers and information.

Of the many visitors, a wounded sergeant remains in one's memory. The front of his overcoat is covered with a thick crust of frozen blood. But this worthy soldier presents his important report on the enemy clearly and with complete self-control. Only then does he inquire about the doctor or first-aid station. Other visitors have adhesive tape with some bandage material beneath it across their frozen noses or excoriated cheeks chapped by the icy wind. A regimental commander has been carrying his arm in a sling for weeks, yet takes part in the battle day by day, firm and reliable. *Such also is the spirit of the troops!* These are the formations and leaders who give power and hope to the command, who make it strong.

The reports and statistics concerning a successful attack with hollow projectiles (new type German projectiles) on hostile tanks, bold assault-squad enterprises, and the courageous activities of small groups, however succinctly and soberly they are given, are like warming sunshine which touches the heart of the commanding general in these cold days and gives him the power to bear the burden of responsibility. To be sure, there occasionally comes an officer who himself gets some strength from this little hut and who draws confidence from the brief, clear words of the commanding general. This, too, is a part of the art of war and an integral part of the



command of troops. It is the art of inspiring human hearts.

No typewriter rattles in the hovel. Bundles of documents, maps, and surveys are absent. Everything that could be useful to the enemy has been burned. The clerks have been sent on ahead. The main part of the subsidiary staff is somewhere with alerted units and other combat formations.

Outside, where a sea of vehicles, principally sledges, stands along the road and far beyond it, where thousands of men have for hours been awaiting orders, a plane has just landed despite the gusty wind. A sergeant, his automatic pistol hanging about his neck, gets out of the plane with a companion and reports the valuable nature of his cargo. It consists mainly of ammunition for antitank weapons, mortars, and automatic pistols. The gunners and tank hunters fall to and forget the cold, their stiff fingers, and their tired eyes. Many of these men have been in combat uninterruptedly for five days and nights, or on the road in snowstorm and winds as cold as in Siberia. Some hundred meters to one side a group of utterly exhausted soldiers wait indifferently and apathetically beside their equally fatigued horses, leaning half asleep against sleds and wagons, waiting, ever waiting for the word of release: "Up, forward!"

It does not come.—

Meanwhile an important conversation by radio has taken place in the hut. It completes the picture of the situation which is becoming more and more critical. For many hours reports from one division have been completely missing. It must be remembered that this unit also is in a hard defensive battle today, and is hard-pressed by the enemy. The first general staff officer of the corps [I-a, Chief of Staff and Operations Officer combined.—Ed.] is sent to this division staff. It is indeed almost dark, but the trip through a region endangered by the enemy must be ventured. The command needs an understanding of the situation, while the division, needs an understanding of the intentions of the corps. Quickly a motor car drives up, picks up the I-a and two companions and slowly seeks a path through the confusion of men, horses, and vehicles.

Only some hundred meters farther up front, advanced beyond the last huts of the village, stand the security units of the grenadier regiment engaged here, and when the enemy starts a new attack the reports of some field howitzers, whose fire position is near the hut of the corps commander's CP, cause the whole miserable shanty to shake. If the noise of combat comes nearer, everyone looks for his gun to see that it is near at hand—then back to the map or message book.

All the houses of the village are full to the bursting point, and everywhere soldiers are seeking protection against the wind. Because of danger from air attack, the windows are covered with overcoats as improvised curtains; only the bleak light of two

candles illuminates the general's hut. The hard day's work has lasted very long. Late in the evening an orderly brings some rice soup in two kettles from the field kitchen. There is meat in it, but bread and potatoes are lacking, here as everywhere else. And thoughts are now with the fighting troops who often have to do without even this simple meal, with the problems of the corps, with the expected reports and the decisions which must be made. Looking ahead and weighing all possibilities, the few men in this room think and act.

The two orderlies spread out some straw in one corner on the earth floor, the quarters for the night of the commanding general and his officers. But there is no thought of sleep. The door opens again and again. Officers, doctors, officials, soldiers of all kinds keep coming to ask for advice and information, runners bring in radio messages, administrative officers report on formations and units discovered with difficulty in the tangle of men, animals, and vehicles. [It is most unlikely that all this would take place in the very room where the German corps commander was working. Actually, the various visitors would not be admitted to the commander's room, but would be interviewed by subordinate members of the corps staff.—Ed.] Thus the general staff can get an idea of the arriving combat troops and trains. Two officers have not yet returned. They are awaited with impatience. They are the first general staff officer and his companion.

Finally—it is long past midnight—the first general staff officer returns and reports the completion of his mission and the situation of the division which had been unable to report its position because of communication difficulties.

Through the windows, which are thickly coated with frost, the light of breaking day penetrates. A mug of field-kitchen coffee takes the place of washing, breakfast, and morning toilet; one scarcely smoothes one's hair with one's hand. Everybody starts again on the day's work.

Outside, the waiting soldiers stand at their vehicles, wrapped in their overcoats and with blankets over their heads. Shivering from cold and stamping their feet in order to keep warm, they have been awaiting the new day. The men look toward the end of the village in the southwest. There the last scout squads are returning from their night patrol.

The basic rules of the art of war are ancient, but their application always remains young, vital, and manifold. The observance of their fundamentals alone does not by any means guarantee victory; the fortune of war also must not be lacking. But in the long run, fortune favors the brave. The troops led by this corps general staff remained strong and undismayed even in this battle. Nothing came to them as a gift; what the command planned they had to earn by fighting—in a hard, bloody struggle. In the end they achieved the breakthrough and victory.

# The American "Sherman" Tank

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Eberhard Schultz, war reporter, in *Die Wehrmacht* 14 April 1943.]

*While this article contains a considerable amount of enemy propaganda it is published, nevertheless, to show the respect which the Germans obviously hold for our "General Sherman" tanks. Also of interest to us are the few sentences referring to American tactics at the Kasserine Pass engagement.—THE EDITOR.*

THROUGH THE STREETS of Tunis rolls the American Sherman tank—alive, with moving treads and purring motor, with captured ammunition in the firing chambers, and with the German scouting detachment which captured it on that gray, foggy morning of 22 February on the hills of Sbeitla as a crew. The journey had pursued its course down from the hills, through the sea of olive hedges in the direction of Sfax. The Tunisian colonists looked on in astonishment. The Arabs peered cautiously out of their white villages. The tank rolled in its journey past Roman ruins and over the dry wastes of bygone centuries, finally reaching Tunis. It was a distance of almost 220 miles. This required four and a half days which is no poor testimony to the ability of this steel colossus. It is driven by a radial airplane motor of 400 horse-power, attains an average speed of 25 miles an hour, and has a crew of five men. Its dimensions—length, 6.15 meters; width, 2.65 meters; height, 2.71 meters—gives its exterior a squat appearance. It weighs about 31 tons. It was loaded up at the port while German fighter planes circled in the clear sky and no hostile bombers dared to break through into this deadly zone. Now, after a long journey, this star of the American armament industry has reached a testing field in the vicinity of Berlin and is in the hands of weapon experts who are testing it in open combat conditions once again to ascertain its combat ability and resistance. Already the preliminary tests in Tunisian soil had shown that this rolling steel fortress is no poor creation. It was a German armored regiment that captured it.

A trip among the wrecked American tanks, past the Sbeitla highway, clear to the Kasserine pass showed that these heavyweights of the American equipment could die just the same as other tanks as the result of a shot which hit the treads, by means of another which hit the gas tank, or by means of a square frontal hit which, indeed, did not damage the steel covering but which stunned the crew or put the commander, the gunner, or the radio operator out of action. A few tanks whose mechanical structure is not fully destroyed show evidences that the crew, in spite of the steel armor, was so affected or so terrorized mentally that they abandoned the tank.

In form, the steel covering presents an undulating appearance. From the revolving turret on down, the metal is as filled with curves as if human hands had modeled it of clay and not of the hardest of metals. The colossus rolls on tracks padded with rubber. As a result of this it possesses an easier and certainly a quieter movement than other tanks. The advantage in open terrain is obvious. The worried American officers who were brought back by German infantry from the battle field at the point of a pistol soon recognized, however, that they had kept their steel cohorts too closely together and they had been wiped out in a valley sector. In this case, the Americans had been victims of a false conception of the hedgehog formation. The defeat of the American armored regi-

ments cost but a fraction of the German attacking forces. But, we must add, the victory was due to a great deal more than the experience gained by the German commanders in the course of four years of warfare; it was gained by commanders, gunners, and tank drivers.

The murderous 75-mm cannon of our tanks was not invented on the first day of the war. Hence the groping shots fired at an increasing tempo till the last, destructive round; also the invisible cooperation between the driver squatting and crouching behind the track machinery and the commander who brings his steel mount forward through the waves and depressions of the terrain, through the shadows of the cacti, and past the olive trees as through the deeps and shallows of a dangerous sea. In fact, he moves his tank forward not unlike a submarine pilot stalking his prey. The Americans also attempted this maneuver of a shifting approach and encirclement. We saw them on one of the later days as they moved away like a slinking caravan behind the ridge of a hill with only the gun barrels and the tips of their turrets showing like distant periscopes. We saw how the adversary soon changed his fixed system of attack of the first day for a more flexible one.

The other types were more easily knocked out. The General Grants, the Stuarts, and General Lees, the many MTW's, the troop-carrying vehicles of the United States Army, which, together with their ammunition, burned throughout the evening and night like a whistling and crackling display of rockets.

But there were Shermans also among the victims. On the first day the contrast between the dynamic, German method of fighting and the stiff American manner was somewhat like that between swarms of riflemen of the Napoleonic era and the four-sided human square of the preceding century. But in the very next engagements the comparison no longer held. To begin with the Americans were correct only so far as their matériel was concerned. We may and must admit that we were confronted with a weapon which, in its mass employment and the convolutions of its forms, the thickness of its armor, the power of its ammunition, and its numbers, was imposing to us!

The armor of the turret has the considerable thickness of 85 millimeters and in other places, such as the body and the covering plates on the stern, varies between 45, 55, and 65 millimeters. The cannon itself has a caliber of 75 millimeters. A 12.5-mm machine gun, mounted in the open beside the turret as an anti-aircraft weapon, is an interesting feature. There is a machine gun in the bow. The amount of reserve ammunition is considerable: 100 75-mm rounds, 8000 rounds for the machine gun, and 300 for the anti-aircraft machine gun. The rate of fire of the cannon is about 10 rounds per minute when in motion and 12 rounds per minute when halted. The machine gun and cannon cannot be coupled or fired together at all.

America's war has been waged with great intensity on the construction table. But what is lacking is the personnel to man all this matériel correctly and cool-headedly. The Americans also lack the highest of tactical knowledge, a factor which every strategist must have at his command.

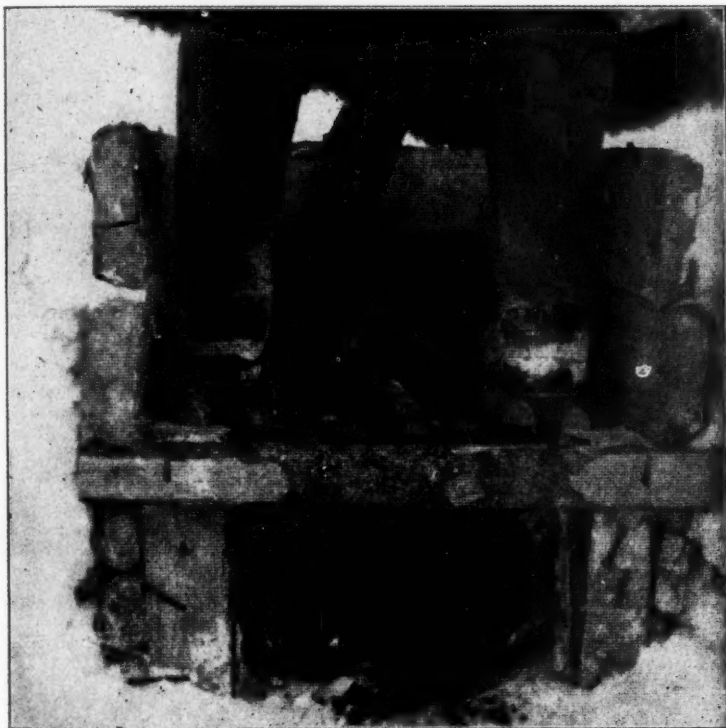


# MILITARY NOTES AROUND THE WORLD



## GERMANY

*How German Sentries Keep Warm in Russia:*



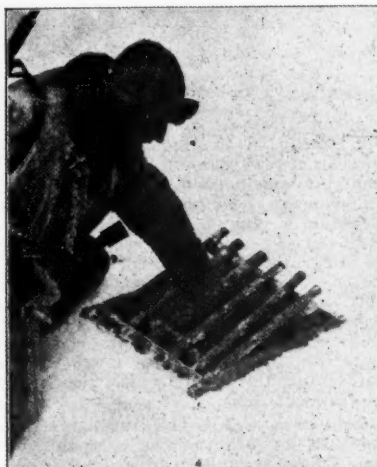
A box transformed into a footwarmer. Two pieces of sheet iron protect the charcoal from being extinguished by the snow and the sentry from too intense heat. The stove pipe between the man's feet is

The sentry below has filled two ordinary tin cans with burning charcoal and



made of ordinary tin cans. It carries the smoke to a place where it will not betray the sentry's location.

The tin-can stove pipe also warms hands.



is hanging them by wires from the grate on which he will stand.



A large round stone has been heated thoroughly on the bunker stove. Placed in a hole in the ground under the sentry's feet, it will put out comfortable warmth for hours.

*(Berliner Illustrierte Zeitung)*

## Destruction of Tanks:

The German soldier makes use of a special mine which is particularly effective in the combat of tanks, the so-called "Haftohlladung" [clinging hollow charge] which is able to penetrate armor and which is provided with magnets. By means of these magnets the explosive clings to the enemy tank when the grenadier has attached the mine, it does not slip down the surface nor fall loose on account of the motion of the tank, and it deals a knock-out blow to the most sensitive parts. Innumerable Soviet tanks have been destroyed with this mine although they have attempted to defend themselves from it by coating the surface of the steel plates with clay.

When the cry of "Tank," "Tank," "Tank" flies from rifle pit to rifle pit, the grenadier lays out his concentrated explosive charges, Molotov cocktails [incendiary bottles], and mines in readiness and waits until the monster creeps up. By its



## MILITARY REVIEW

silhouette he recognizes the type of the Soviet tank and automatically knows its weak spots. While his comrades keep the Soviet infantry under fire, he springs into the dead angle of the tank's field of fire, applies his hand grenades, mines, and Molotov cocktail, and disappears under cover in order, after the explosion, to annihilate those of the tank crew that are still alive. Naturally, all this is more easily said than done. . . .

(Völkischer Beobachter)

### Motorcycle on Tracks:



Illustrated is a caterpillar-type German motorcycle used in traversing difficult terrain.

(Magyar Erő, Hungary)

## GREAT BRITAIN

### Recovery of Motor Vehicles in North Africa:

With the British Eighth Army in North Africa, recovery and repair of motor vehicles are the function of the Corps of Royal Electrical and Mechanical Engineers, which was established as a separate entity last September. Since then, the Eighth Army, which at the beginning of its career proved so inferior to the enemy in these branches, has made such progress that it has become a model for all British and Allied forces. Every mechanized unit has light aid detachments of the Royal Electrical and Mechanical Engineers. Everything is done to keep all units of the R.E.M.E. in constant contact, and a growing number are equipped with wireless. This enables the greatest measure of control and coordination over large distances to be exercised from headquarters, and allows forward units to let their wants be known without delay.

Between the beginning of the battle of Alamein and the capture of Tripoli Royal Electrical and Mechanical Engineer units recovered many hundreds of armored vehicles, including armored cars and Bren carriers, and 8,975 "B" vehicles—that is, lorries and vehicles of all types other than armored. They repaired many hundreds of armored vehicles and 18,750 "B" vehicles. In addition, and as distinct from recovery from the place of breakdown, Royal Electrical and Mechanical Engineer units "lifted" from one place to another (for instance, from collecting points to workshops) hundreds of armored vehicles and 1,000 "B" vehicles. This work of recovery is not always necessarily carried out in rear areas. On one occasion towards the end of the Tripoli campaign as many as 600 "B" vehicles were in course of forward recovery simultaneously. The paradox that repairs exceed recovery is explained by the fact that many vehicles are driven to the

workshops under their own power. As the standard of maintenance in the Eighth Army improves, the number of recoveries decreases in relation to repairs.

These figures give an idea of the magnitude of the armada by which the Eighth Army lives, moves, and fights. A few additional figures may guide the imagination. In one 24-hour period early in the campaign 88 heavy tanks were repaired in the battle area, 36 of them in one corps only; on another day some 90 tanks were recovered. In the case of "B" vehicles the figures are naturally far higher; thus the Royal Electrical and Mechanical Engineer complement of one small formation alone is recorded to have recovered 28 in one day. Completely self contained recovery sections often go out on an expedition lasting several days. One of these was away for 10 days, during which it drew no rations of fuel, water, or food. In the course of that sweep it recovered not only a large number of tanks and lorries, but also brought in their crews and collected 200 prisoners.

(The Times, London)

## ITALY

### Italian Artillery:

**Coast Artillery.**—Italy's coast artillery consists of railway cannon, permanently fixed cannon, and a few heavy field cannon, in addition to machine guns and antiaircraft cannon. Former naval guns have been used for the railway artillery, which has been partly protected by armor. According to *Militär-Wochenblatt*, No. 49, 1942, they have an unlimited lateral field of fire.

**21-cm Mortars.**—The 21-cm Ansaldo L/22 Model 35 mortar adopted in Italy has a screw type breech block and split trail. Its elevation varies between 0 degrees and plus 70 degrees; its traverse covers 75 degrees. With a projectile weighing 101 kilograms and an initial velocity of 570 meters per second, a maximum range of 16,000 meters is attained. The gun, which has a firing weight of 15,800 kilograms, is transported as a single or double load. The gun when traveling as a single load weighs 15,780 kilograms; the barrel on its transporting vehicle weighs 8,200 kilograms. The gun carriage alone weighs 10,800 kilograms. In mountains, according to *Nazione Militare*, the gun is broken down into four loads and loaded on four vehicles with caterpillar treads.

(Artilleristische Rundschau)

## JAPAN

### Japanese Artillery:

**10.5-cm Cannon.**—The 10.5-cm Schneider cannon, L/40 Model 29 or 30 is a weapon of proven worth. It weighs (split trail, gun shield, solid rubber tires) 1,950 kilograms in firing position. Its maximum elevation is plus 65 degrees; its traverse is 54 degrees. With a projectile weighing 16 kilograms (a shell) and a muzzle velocity of 764 meters per second, the cannon, according to Passow's *Handbook of Armed Forces*, attains a range of 18,700 meters. The cannon is said to be well motorized by means of a large tractor with caterpillar tread, which also serves as crew carrier.

**Mountain Gun.**—The infantry regiment, in its infantry gun company, has four 7.5-cm mountain guns, type F. According to Passow's *Handbook of Armed*

*Forces*, they have been modeled after the "Krupp M 08's." Their carriage is provided with a gun shield and has small wheels. The gun is drawn by one horse or by the crew of six men.

**Rocket Gun.**—At Singapore the Japanese made use of great numbers of rocket guns which are said to have been constructed by Colonel Kuwata and are characterized by very light weight. *Militär-Wochenblatt* of 5 June 1942 states that the projectiles are fired from a very light frame according to the rocket principle and produce a very powerful explosive effect.

(Artilleristische Rundschau)

### One-man Pneumatic Raft:



Fully equipped and with his pneumatic raft inflated, the Japanese soldier stands on the bank of the river and awaits the command. A safety belt protects him in case of emergency.



The trip across the river has started. The soldier has placed foliage across his shoulders as camouflage and a smoke screen covers his movements, making it difficult for the enemy to recognize and interfere with the operation. The man rows rapidly forward with short-handled paddles. When the opposite shore is reached, the raft is quickly deflated and folded up and the soldier is ready to continue his advance toward the objective.

(Die Woche)

## MILITARY NOTES AROUND THE WORLD

### How Japanese Soldiers Learn to Drive Tanks:

Future Japanese tank drivers are trained with an odd piece of apparatus before their eyes: it represents the "seeing slit" in a real tank. The recruits learn in this way to adapt themselves to the conditions under which they will have to



drive a tank and get used to looking over the terrain through a very narrow slit. (Die Woche)

### Japan's High-Sea Trucks:

In the economic sphere the Japanese military administration, during the first year of the East Asiatic war, was able to repair all important war damage in the southern area and to start production again in the major pre-war industries, e.g., oil, coal, metals, iron ore, nickel, copper, rubber, vegetable oils, and other agricultural products.

The traffic problem has become rather pressing, since goods of which there is a plentiful supply become valueless if they cannot be moved to some locality to be processed. Accordingly Tokio drew up the following plan which is now on its way towards speedy realization. Wooden vessels gradually are taking over the total coast-wise traffic. They pick up their cargoes at thousands of small island harbors and discharge them at the large ports of Singapore, Batavia, Surabaya, Saigon, Manila, Hong Kong, and Bangkok. This limits the Japanese merchant marine to the task of shipping cargo from these to the other large ports in Japan, China, and Manchuria. The Japanese tonnage is sufficient for these operations. As previously reported, the Japanese government after long deliberations chose as the ideal wood-vessel type a motor boat of either 100, 150, or 200 tons powered by Diesel engines. These boats are now in series production. Because of their shallow draft and their maneuverability these boats can land anywhere and do not need large modern installations in order to take on or discharge cargo. They are relatively submarine-proof, primarily because they operate in shallow coastal waters which are not navigable for submarines. It should also be considered that because of their large numbers the risk of loss is decreased, especially as this type of boat hardly warrants expensive conveying. Large movements of goods between the main ports will be taken care of by the big units of the merchant marine, convoyed by the Japanese Navy.

Several thousand small Japanese shipyards have expert experience in building these types. These shipyards have been concentrated in 600 installations which are now charged with governmentally supervised series production. In addition, leading shipping operators are constructing twenty new special yards for the production of these so-called "high-sea trucks" whose speedy swarms will relieve the Japanese merchant marine as the truck has relieved the railway.

The construction of wooden ships is an old Japanese industry in which the Japanese carpenters have acquired unusual skill. Thirty carpenters are able to build a 100-ton boat in 100 days. Numerous Japanese carpenters also go to the southern area where they find employment in the small local yards. These yards have the same type of boat in series construction, using gangs composed of fifty local carpenters under one Japanese foreman. Singapore, Macassar, Medan, and Saigon are announcing launchings and the completion of similar installations. In the southern area progress is also being made in salvaging the ships sunk during the war. The Japanese are also masters in this operation. A high-sea raft, drawn by tugs, capable of transporting a considerable cargo of wood is being used increasingly after satisfactory trial runs.

(Kölnische Zeitung)

### Artillery—Plane Equipped with Cannon:

One of the most recent types of Japanese pursuit planes is the Navy pursuit one-seater Mitsubishi 00 (1940) which is equipped with additional detachable fuel tanks and is armed with two 2-cm cannon in wings and two fixed machine guns. It has recently been used in the southwest Pacific.

According to *Interavia* of May-June 1942, a second pursuit plane with the designation 00 seems to exist, which, however, mounts four 2-cm cannon and displays higher velocity.

A further development of the pursuit one-seater Mitsubishi 00 is the new pursuit plane S-01 which the Japs have used in their air attacks on the bases in northern Australia. It is said that this plane is equipped with two 2-cm cannon and seven 7.7-mm machine guns, attains a greater elevation, and is heavily armored. (Artilleristische Rundschau)

### U. S. S. R.

#### Soviet Cavalry:

The Soviet army has the most powerful cavalry force in the world, and today it is in even better condition than at the beginning of the war thanks to its extensive reorganization, its more powerful weapons, and its increased use of motor transport. It is composed not only of the famous Cossacks of the Kuban and the Don but also of many horsemen of the Eastern Soviet Republics.

Cavalry has proved exceedingly useful not only as a scouting element both for ordinary reconnaissance and for combat reconnaissance, but also as a pursuit force in the winter offensives, riding down the fleeing enemy after tanks and infantry have smashed his lines. Except for small combat reconnaissance detachments on special missions, cavalry detachments are not usually mixed with other branches of the army. Main bodies of cavalry are held in reserve and are used en masse only in winter and at the

right tactical moment after the initial breakthrough. The horsemen, plowing through snowfields and woods, are then able to outmaneuver an enemy limited to the highways. The cavalry is also very useful for night work.

The famous long and heavy brass-handled saber is still used but has been largely superseded by automatic arms. Tommy-guns, heavy machine guns, and automatic rifles are used by the cavalry in great numbers. There are also vast quantities of "tachanka" carts (carts drawn by three horses) bearing machine guns. One great improvement is the widespread introduction of antitank guns, both heavy and light. The latter—long-barreled antitank rifles—are carried by horsemen in the same fashion as the old lance.

The old handicap of horse-drawn baggage trains has been largely eliminated by the introduction of motor transport. Today, within a range of 150 miles, cavalry can be just as mobile as any other troops, thanks to trucks. This new tactical mobility is a big advantage.

(From the *New York Times*)

### Tank-Plane Cooperation:

Soviet military opinion on the subject of tank-plane cooperation on the battlefield is summed up by Lieutenant-Colonel V. Murashko, commander of a guards tank regiment of the Soviet Army.

According to Colonel Murashko: "Special emphasis should be placed on the subject of tank-plane cooperation on the battlefield. Although this is a complicated matter, all difficulties in this regard must be overcome. The air service must not only cooperate with tanks in combat but at the same time it must perform its reconnaissance missions, serving as the eyes of the tanks when the latter seek to advance swiftly. Planes must help tanks to find the enemy, guide them to the targets, and warn them of enemy concentrations in places where the armored vehicles, for obvious reasons, cannot themselves see the enemy."

(Izvestia, Moscow.)

## UNITED STATES

### Military Maps From Photographs:

In the last ten months more than 1,600,000 square miles of the earth's surface have been photographed for military purposes by the Army Air Forces. The resulting pictures have been worked up by the Geological Survey of the Department of the Interior into maps of vast areas hitherto inadequately mapped or not mapped at all. This will increase greatly the efficient operation of our air forces over great stretches of African desert, Asian wastes, South American jungles, and Alaskan wilds.

The photographs are made by army pilots using aerial cameras equipped with wide-angle Metrogon lenses. The Tri-Metrogon method uses three cameras set so that they obtain simultaneous exposures covering an area from horizon to horizon. The center of the three cameras points vertically downward, the ones to the right and left obliquely downward, so that the horizon appears near the upper edge of the photographs. The oblique photographs overlap the corresponding vertical photographs two inches on a 9-inch by 9-inch negative.

(Victory Bulletin of the OWI)



# FOREIGN MILITARY DIGESTS

*Digests of articles from foreign military periodicals. Other items of interest from foreign publications are indicated in the Subject Index.*

## The Atlantic Wall

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Fritz Lucke, special reporter, in *Berliner Lokal-Anzeiger* 13 April 1943.]

AT THE INVITATION of the Todt Organization, we have been on a trip to the Atlantic coast. After an interval of almost three years we were again seeing the country between Bordeaux and Lorient, this broken coast with its many inlets, deeply eroded mouths of rivers, and the famous harbors which of recent years have been turned into submarine bases giving it the name of the Atlantic front. We then traveled from Boulogne through Calais and Dunkirk, over the battlefields which we once knew as a soldier, to Ostend and Zeebrugge. As we traveled along these coasts we saw not only the Atlantic coast with its submarine bunkers and other structures which have become familiar even to the home front through numerous accounts, pictures, and news reels—rather, we were passing over a new battleground of labor. For this is the proud result that we are able to report to our people.

This global war has taught us to think in terms of time and space which come close to the limits of ordinary human understanding. It is gigantic in all respects. And so also is the project of the land fortifications of the west, that is, the whole "wall" from the Pyrenees to the North Sea, so bold and in the shortness of the time of its construction so overpowering that even words such as "gigantic" and "mighty" seem extremely poor and insignificant. Even the length of this chain of bunkers, gun-positions, and field fortifications emphasizes this fact: it is over 1,600 miles long. Measured by air, that is the distance from Berlin to Casablanca or from Berlin to Alexandria.

A glance at the wild, broken coast with its river mouths, some of them miles in breadth, and with the promontories at Brest, Cherbourg, and Calais, makes this figure comprehensible. The coast itself is naturally an obstacle which is difficult to overcome. The two attempts of the English of last year, one at Saint Nazaire and the other at Dieppe, showed this. Flat and steep coasts are counted out at the very outset for greater troop landings. Hence, the first requirement was to protect the ports with the submarine bases and branches of estuaries, for without the possession of a large harbor, a bridgehead cannot be held.

### EMPLACEMENTS AND BUNKERS

This is the striking picture in every harbor, anywhere on the Atlantic coast. Straight out of the water of the harbor basins rise the submarine bunkers and giant cranes, visible for a long distance on account of the circle of captive balloons floating above them. Their appearance is familiar from pictures and scenes from the news reel. But it is not till one stands personally in front of them that

the daring and genius entering into their planning is fully realized. It is a known fact that the Führer himself, in a rapidly executed sketch two and a half years ago, gave Dr. Todt the order for the construction of these giants for the protection of the submarines against air attacks during the period of their overhauling. Dr. Todt and his chief construction foremen, engineers, and laborers translated this plan into fact with a speed and on a scale that deeply impresses the spectator and renders him speechless with astonishment.

They are, naturally, merely practical structures of reinforced concrete, the hardest material that we know of at the present time, solid as natural rock, yet in their monumentality with their projecting tops and their walls inclining forward, they are nevertheless structures of architectural beauty. The tops—this has been proven—are able to withstand even the heaviest British bombs. Indeed, the points of impact—and these are rare enough—are considerably less in depth and extent than the holes which our heavy Stuka bombs made in the rock of Tobruk. The interior also is a marvel of German architectural skill and practicability. In the rooms new torpedoes are prepared, in the adjoining halls shells are piled, in the workshops work is done—in short, everything is there that is necessary for overhauling, repair, and preparation for new sorties.

From these bases, our gray wolves are at England's throat with a single leap. The number of our submarines increases constantly. In accordance with their numbers, so also must the number of submarine bunkers increase. There is so much space ready now—as we were assured by the employment group leader of the Todt Organization for the entire western fortification works—that all the Atlantic submarines are able to dock. And the work is keeping pace with the war.

From the high pinnacle of such a submarine bunker, there is offered an imposing view of the work. To the layman it appears at first like a gigantic ant hill with the many thousands of foreign laborers, like the building of a second tower of Babel, till finally he slowly gets an insight into the purposefulness of this organization. He sees alongside the finished bunkers new wooden forms rise, iron rods bent at the ends into hooks like gigantic walking sticks and woven iron baskets. Great snake-like tubes rise high into the air; cement is pumped up and flows into the forms to unite with the iron rods as granite-hard concrete. Yonder stand walls already poured; cranes lift heavy iron girders onto them; meter by meter, new roofs are built up.

The air is filled with the hissing and hammering of the steam pile drivers. The ground water naturally stands very high here on the coast and there are bad locations in sandy and marshy terrain to be overcome. Great square pilings of concrete with pointed ends—lead pencils from the land of giants—are driven one by one into the earth till the ground



offers a new and firm foundation. Railroad trains and trucks carry cement and gravel. The harbor basins themselves change their aspect. Old coffer-dams are blown to pieces; dredges and clam-shell dippers remove thousands of cubic meters of earth; soil is washed away.

Farther to the rear we saw a car moving slowly with a high steel dome. It was an armored cupola weighing over 100 tons which formed the heart of a bunker for the protection of this submarine base.

New knowledge is gained daily from the war, and not least, knowledge relative to the construction of fortifications. The "West Wall," the Maginot Line, field fortifications in the west and in the east, and the bunkers in the sandstone of the Tobruk fortifications have provided information for our fortification engineers which they were able to use to their profit in the construction of the Atlantic Wall. The construction of the bunkers and works is determined by the fortification engineers in accordance with the nature of the terrain and the use to which the weapons are to be put—whether they be machine guns or antitank cannon, whether howitzers or heavy cannon, whether anti-aircraft cannon or mortars. The various installations are standardized into definite types. This explains the astonishing speed with which they have been completed.

We traveled along the dunes over a concrete highway resembling a small automobile highway. It was built by the Todt Organization. We really saw nothing, for the bunkers had disappeared in the sand of the dunes. We rolled along over one of the beautiful French highways. We had swept over them in June 1940 in a reconnaissance detachment. The engineer officer pointed out strong points here and there over the country. Not till then had we noticed that everywhere, inconspicuously adapted to the terrain, bunker domes and armored cupolas dominated the country. For the ports are not protected from the side of the ocean alone: in a wide circle on the land side also, the supporting points and groups surround them.

It is said of us Germans that we are thorough. We can assure the world that the work done on this Atlantic Wall is truly thorough. Our route led through a piece of woods past warning signs with "Achtung Minen!"—"Danger de mort!" ["Attention, mines!" and "Danger of death!"] along past a little group of villas. But the villas were not houses, the windows were not windows, the trees were not trees! They were really bunkers, dwelling places for the artillerymen of a heavy railway battery who, with their gigantic cannon covered with camouflage nets and camouflage green, discharge their difficult task of waiting. After the quick and thorough failure of the British landing attempt at Dieppe in August of last year, the Führer gave the order for the construction of this new line of fortifications with the motto: "The Atlantic Wall stronger than ever!" At the same time he gave the order that every German soldier be protected by reinforced concrete. And so, in our trip along the coast, we not only found bunkers with emplacements of all sorts, but also colonies of bunkers whose sole purpose is to provide a safe roof over the heads of the soldiers. These concrete structures protect them against the heaviest attacks with bombs and shells till orders call them to their weapons in the combat bunkers.

Differences in the nature of coasts, terrain, and harbors are naturally reflected in the varying defense installations. For instance, we have a little island in the midst of an estuary. It is flat, with a small green dome. It appears as uninhabited as ever. But the island has become a small bulwark of defense commanding the estuary, with its weapons mounted on concrete emplacements. Day after day and night after night the sentries stand here at their observation posts looking over the stream and its shores. The signal whistle of the Lieutenant broke the monotony

of their task. We saw how the little island fortress was able suddenly to change its appearance. Orders were shouted, camouflages disappeared, the ground opened up—antitank cannon and light and heavy machine guns announced their readiness for fire. Everything operated perfectly for it was often practiced, and they will yet have to practice it often, these young soldiers who, separated here far from any city, in the solitude of water and land, of sun and fog, must wait for the moment when it will be necessary to fight. The soldiers do not know whether they will ever be put to the test in just this place. However, they must not become fatigued with the monotony of the daily service. This nerve-racking task of being constantly on the alert must not be underestimated. It too is one of the hard duties of the soldier.

#### THE DESERTED "COAST OF LOVE"

The long coast with the noisy bathing beaches and the famous and ill-famed *Côte d'Amour* where international plutocracy lived an easy life in cheap glamor and false magnificence is empty and deserted. Only the law of the German soldier and laborer prevails here now. Cities and villages have to a large extent been evacuated. The coast lies behind an endless stretch of barbed-wire entanglement. Where once highways ran along the sea and beaches, concrete barriers have been poured. Even if the Americans and British should succeed with their shallow boats in unloading tanks at any place, they will seek in vain for a place to pass through. They will be shot to pieces on the beach exactly as they were at Dieppe.

Cities and ports in the northern sector of the Atlantic front, in Brittany and Normandy, have been hard hit by the British bombers and incendiary murderers. The military reports from the Führer's headquarters have occasionally announced it. The cities and the ports of Saint Nazaire, Lorient, and Brest have been turned into fields of ruins. But their bombs were powerless against the submarine bases and the bunkers of the Atlantic "West Wall." And so, unharmed in the midst of the ruins, stand the emplacements and fortifications of the Todt Organization, of the Atlantic front, this fortified work which in the extent and ponderousness of its structures is now the greatest of this century, begun by Reichsminister Todt and continued and completed by Reichsminister Speer, his successor.

#### THE TODT ORGANIZATION LABORER

We have tried by means of words to draw a few pictures, to give an approximate idea of this German "Atlantic Wall." In doing this we must not forget the men who translated the plans of this line of fortifications into fact, into iron and concrete. It is the work of the Todt Organization laborer, by which we mean all, from the chief construction foreman down to the ordinary man in the brown uniform and the arm band, "Todt Organization."

The "West Wall" was built in Germany exclusively by German laborers. Nearly a thousand German building contractors, a great working community of construction laborers with their engineers and tested chief personnel with the allotment of auxiliary laborers, were employed at that time. It was possible to use the most rapid means of transportation. The routes leading to the work were short, and it was in time of peace. All these factors make the construction of the "West Wall" appear almost easy today. The German laborers of that time are mostly in the army or in the armament industry. The last of our younger men have now, as is the case everywhere, been turned over to the armed forces and industries.

The German Todt Organization laborer of today is for the most part an older man with gray hair. Many were in the first World War and often wear war decorations on their uniforms. The man has been away from his home

and family for a long time. The round of his daily program consists only of heavy labor and sleep in the Todt Organization's home or camp. During his few idle hours he is given further training by officers or noncommissioned officers in the use of arms, for, if worse comes to worst, they intend to defend themselves in the bunkers which they have built. Yes, it can be said that they also belong to the armed forces on the Atlantic coast.

Their helpers are laborers from many parts of Europe and North Africa: Dutch, Flemish, Walloons, Spaniards, Frenchmen, yes, we even saw Moroccans. To one German laborer there are on many of the jobs, 50, 100, or even 200 foreign laborers. They are volunteers and men who are liable for military duty. Altogether there is an army of one hundred thousand men engaged here, a number which will increase still further in the months to come and which is an additional proof of the magnitude of the project. It is self-evident that this employment of foreign laborers not only occasions difficulties for the direction of the Todt Organization but also for the simple Todt Organization laborer himself which can only be imperfectly understood by the man of the home front. But what is remarkable is the willing faithfulness of these men from whose hands these modern proofs of the German martial spirit have arisen in steel and concrete and will continue to arise.

### An Advanced Observer For A Heavy Field Howitzer Battery

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Lieutenant Geiser in *Artilleristische Rundschau* June 1942.]

THE HARD FIGHTS on the eastern front in 1941 taught new lessons to all the arms. The vastness of the area, the flatness of the terrain, and the poor highways and roads created conditions for our operations quite different from those to which we had been accustomed in France. In addition to this, the artillery frequently had to work with unsatisfactory maps. On account of the lack of dominating points from which to conduct observations, advanced observers assumed a greater importance.

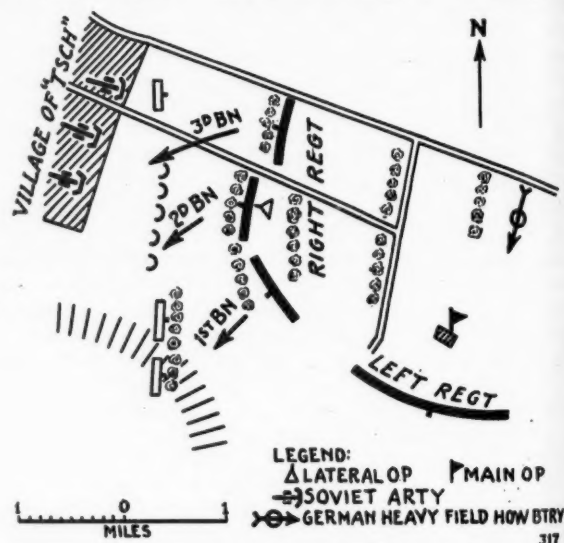
The very mobile observer advances with the infantry and remains close to it. In this respect the Rumanians offered us a good example. Their observation posts had the smallest possible personnel and were, as a result, very mobile and hardly to be distinguished from the infantry in the terrain. Generally, they consisted only of personnel connected with the firing and the transmission of messages. This corresponds closely, therefore, to the composition of our own advanced observation post.

On 6 September the heavy field howitzer battalion was stationed back of the left regiment (see sketch). As the fighting progressed it became apparent that the main resistance was in the right sector. Hence: "Lateral observers to the right regiment!" The flexibility of the trajectories gave faultless results even without a change of position.

It was left to me to choose which infantry battalion I would be with. Naturally, it is an advantage for the advanced observer to be already known to the infantry and always assigned to the same battalion. This cannot be done, however, in the case of an observer for a heavy battery, for while light artillery battalions almost always cooperate with the same infantry regiment, the employment of heavy artillery battalions depends on the location of the division's point of main effort. In seeking my place I was governed only by the advantage of the location. I was not influenced in my choice by the location of the command

posts. I merely established contact with the infantry and made inquiries concerning its particular desires and the situation at the time. As a rule, the advanced observer will seek targets which are most suitable for a heavy battery, such as infantry assemblies and enemy batteries. To be sure, he may in many cases be given suggestions by the light artillery battalion working in the same sector, but he will not permit himself to be bound thereby.

The attack on point targets according to the gunnery manual will not always be advisable for heavy field howitzers because of the magnitude of dispersion under battle conditions and because of ever-needful economy of ammunition. Nevertheless, the attack of an emplaced hostile battery, which I discovered open before me on the edge of the village of



"Tsch," finally developed into point fire. I first tried zone fire. But although our groups lay with impeccable correctness, no effect could be observed; that is to say, the enemy continued firing without interruption. Evidently he could not be reached in this way in his deeply entrenched gun positions. Only an accurate adjustment on the individual guns was successful in finally silencing the hostile battery.

After a long period of preparation by the artillery, the attack from the assembly point was launched and moved rapidly forward.

I now had to locate some infantry battalion commander, for it was only from this source that I could learn the situation and pass it on to my battery with my own regular "local" report.

The attack of targets just ahead of our infantry, usually up to 1,000 meters in front of it, was solely my responsibility as advanced observer after the start of the attack. For from this moment on the main observation post lost its comprehensive view, so that it might all too easily mistake our troops for the enemy and fire on them.

As a result of the confidence which the artillery battalion commander had in me, I was also left to decide when it was time for a change of position. In other places it happened that, in spite of requests from advanced observers and the fact that friendly infantry had already passed the limits of the radius of effect, the artillery battalion did not change position as this change was dependent on an order which had to pass by way of the infantry regiment and artillery liaison center.

But even aside from that, the advanced observer through long experience was often able to recognize most quickly the proper moment for a change of position. In addition to this, he often had the opportunity to look over possible firing po-

sitions as the attack progressed, as it passed along by them, so to speak. Also, on the eastern front, it was often necessary to make cover a secondary matter in the effort to get the batteries as close as possible behind the front lines for the attainment of greater range. The advanced observer should also be as mobile as possible for the purpose of exploring the terrain. If the resistance of the enemy had gradually been broken and the infantry was again moving smoothly forward, it was his duty to get to his horse or car as quickly as possible.

Communications remained afterward, as they had been before, a rather uncertain point. But even this service functioned properly under the following conditions:

1. The opposite station had to remain in the main observation post on account of the relatively short range possessed by the pack apparatus.
2. In addition to the employment of the secondary frequency, it was also necessary to set certain times during which a change-over was made to receiving.
3. All radio troops had constantly to make it a matter of pride to have on hand as many plate batteries as possible in reserve.
4. If possible, another set was to be used whenever speech became unintelligible.

If all other means failed, in most cases the soldier in charge of the horses could be sent back to the battery as a dispatch rider in order to restore contact at all costs.

Especially on the eastern front, the importance of the advanced observer became so great that in many cases the battery commander himself assumed this task in the main observation post. This agreed, also, with two fundamental principles of combat, namely, the greatest possible simplification of the machinery of command and the maintenance of the closest contact with the enemy.

## Tanks In a Forest Battle

[An article by Lieutenant Colonel P. Vegerchuk in *Krasnaya Zvezda* (U.S.S.R.) and reprinted in *The Tank* (Great Britain) March 1943.]

*This article contains some terminology which may be difficult for an American to understand. Written in Russian and translated into English for a British military publication, the original text is not available and the Military Review is not able to check on the author's actual wording of certain passages. Nevertheless, the article is believed to be so interesting and to contain so much intrinsic military information that it has been selected for publication.—THE EDITOR.*

EXPERIENCE has proved that it is possible to use tanks in forest regions; the following is an example of such an operation.

On one sector on the front a Soviet Armored Guard unit was given the task of removing a threat to the communications of the advancing Soviet units. The tanks were confronted with a night march of 45 miles over a road through woods and swampy localities marred by ruts, shell holes, half-ruined bridges, and (most dangerous of all) boulders and water from thawing snow.

From four to six hours were available for march preparations. A group consisting of a traffic platoon, an engineer platoon and an antiaircraft unit was sent out for reconnaissance of the proposed route. Tank personnel carefully studied the route, and all drivers were given special instructions. All machines were carefully checked, and necessary last-minute repairs made.

As a result of careful preparations the unit arrived at the assembly point two hours before the allotted time without

losing a wheeled or combat vehicle despite the darkness and poor roads. Although German scout planes combed the vicinity, apparently they found no signs of the movement. This is explained mainly by the fact that each man knew the conditions of march, and observed well the traffic rules of the column.

Upon arrival at the assembly point tank and infantry units immediately began to prepare for the attack. Trees were from six to ten inches in diameter and numbered 125 to 150 per acre, and fields were covered with two to three feet of melting snow. There were few roads or paths in the forest, and the Germans were entrenched and had mined and placed antitank guns on all approaches.

The location of the German defensive system was uncovered by reconnaissance and by raids carried out at all hours of the day and night. It was found that the enemy defense consisted of separate centers of resistance among which the Germans had not yet had time to organize a dependable system of fire. It appeared that the dugouts contained only mortars with which to stop attacking troops. Communications between garrisons were maintained by messengers on foot, as only a few had telephones.

The infantry Commanding Officer gave his orders in effect as follows: The first echelon was directed to move forward quickly, penetrating deep into the defense area to disorganize the defensive system. The second tank echelon, one-half to one-third as strong as the first and carrying infantry and automatic riflemen, was directed to follow 500 meters behind the first and overcome the resistance of any remaining defense points. The combat order included the limits of the artillery, locations of command posts, firing positions, and azimuths of movement. Communications between echelons were directed to be maintained by flares, messenger, and radio, and communications between infantry and tanks by visual means.

In view of the conditions of the area the troops were divided into groups, each consisting of a rifle company, a mortar platoon, and two or three tanks. Each group was directed to move strictly according to its own azimuth; movement on roads and paths was strictly forbidden, since they were mined and defended by antitank weapons. The number of groups depended upon the width of the front, the distance between them on the enemy defense strength; the number of fortified points per kilometer of front.

The attack began at 6 AM when the first echelon of tanks and infantry moved forward supported by intense artillery fire. Infantry followed 20 to 50 meters behind and delivered fire from rifles, automatic rifles, and machine guns. They soon cut into the enemy defenses and broke his resistance. By wedging quickly into the enemy defense the first echelon made it impossible for the Germans to open artillery and mortar fire for fear of hitting their own troops. The Germans merely attempted to direct fire close to their defense formations. The second echelon, 500 meters behind the first, came through unscathed. The Germans were not able to bring accurate fire on this echelon either, because the first echelon of tanks and infantry had disrupted communications and interfered with artillery observation.

As tanks and infantry went deeper into the defensive territory the fighting grew fiercer. Hand-to-hand encounters occurred. The Germans offered strongest resistance in those areas where the garrisons had dugouts. When the Soviet infantry was not able to cope with the dugouts, tanks came to their support; structures often collapsed under their weight.

In one case the tanks could not approach a dugout because of the thick trees that surrounded it, so five or six men were selected to crawl forward. One man threw hand grenades at the exit; another crawled to the smoke hole and dropped a series of grenades into the dugout; the others waited, ready to take care of possible counterattacks.



Excellent cooperation was displayed between tanks and infantry. Sometimes a tank, in crushing a dugout, would get trapped in the pit. Part of the infantry took over the defense, while the rest helped get the tank out of the pit.

The Germans organized counterattack groups of 60 to 70 men, two or three antitank guns, and one or two light mortar batteries. They usually carried their attack along paths and roads rather than through the forest thickets. The Soviets answered these attacks by sending two or three tanks with twenty or thirty automatic riflemen in flank or rear counterattacks.

Groups of four or five tanks with infantry and automatic riflemen on them were used to pursue the retreating Germans. These pursuit groups, traveling by azimuth, seized path and road crossings to hinder the German retreat. They penetrated two or three kilometers into the enemy formation. The attack was a success.

## Employment of Heavy Mortars In Defense

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Lieutenant-Colonel Lehmann in *Militär-Wochenblatt* 11 December 1942.]

IT OFTEN HAPPENS in wide sectors that we are forced to seek other means of increasing the defense power of the heavy infantry weapons. As the fighting strength of the rifle companies wanes, there also drop out certain numbers of machine guns—the weapon which was developed particularly as a defense weapon for the infantry during the World War.

Created for purposes of attack, the mortar today plays, nevertheless, an important role in defense also. Making its fire as effective as possible should be one of the main thoughts of the commander of every machine-gun company and battalion. The ability to concentrate fire and to distribute it both from the points of view of place and time, must, as experience in battle repeatedly shows us, be very much increased.

In attack we have often seen one heavy mortar group assigned to the rifle troops in the front line, and perhaps two mortar groups assigned to the company engaged at the point of the main effort. We ourselves have very often employed the mortar in this manner in defense. But the question whether or not this manner of employment is best may be studied from what follows.

For the purpose of this study it is assumed that the two battalions of an infantry regiment are both made up of three rifle companies which may be said to be the rule at the present time. We assume that 1,000 meters is the width of the sector for each rifle company. The firing position of the mortars is supposed to be about 500 meters behind the front line.

I. The two battalions which are engaged can bring altogether twelve mortars into position. If these mortars are

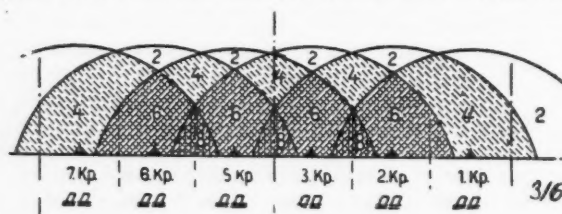


FIGURE 1.

used in accordance with the usual old methods with a mortar group to each rifle company, then Figure 1 shows us the field

of fire of the various mortar groups. The picture is so confused that it takes a person a few moments to see what it is all about. If we assume that the observers in the front lines are also able to see over the terrain of the adjoining sectors, we find three narrow sectors along the front where the fire from eight mortars is massed. These three narrow sectors of the front are the places where the two inner wing companies of the battalion join one another. It is particularly important to guard these points of juncture. This is one of the lessons of war known to every old soldier. The pictorial representation further shows that in front of four of the companies it is possible to have the fire concentration of six mortars, and in front of the two outer flank companies, the fire concentration of four mortars each. The condition under which this is possible is the same as that under which the fire concentration of eight mortars was possible, namely, that all observers be able to see into the terrain of the adjoining sectors. We all know that this is not possible in the eastern theater of operations on account of the nature of the vegetation covering the terrain. On the contrary, it is very often true that one cannot obtain a view of the entire sector of his own company. We will also find it true, as a rule, that these theoretical possibilities which we have pointed out do not work in practice. We must, therefore, seek new methods.

One such way, for example, is for the observer of the first company to fire in conjunction with the mortars of the second company. But this assumes that the proper communications exist, for the trunk lines which the observer has with his own mortar group certainly do not connect him with the neighboring mortar group in concert with which he is firing or desires to fire. Every one who has ever had experience at the front knows that there is never enough telephone equipment or cable available to permit concentration of fire in this manner. The newly introduced field radio set, Model "b," makes for considerable simplification in the control of fire. Through its use it is possible for the observer of the first company to call on the mortars of the second and third companies for their help in case these latter do not have any targets at the moment. But since these three groups of mortars are firing from three different firing positions, the fire control officer, in order to get the fire from all three on the same point, must work with three different fire units. It is plain without any further discussion that in the excitement incident to combat, where even what is simple cannot be made simple enough, many a mistake can creep into the fire control. And so, since the plan that we have just considered cannot by any means be regarded as ideal, we must seek another plan.

II. We have seen that the three separated groups of mortars rendered the control of fire very difficult. We must, therefore, unite the firing positions of the mortar groups in order to do away with the above disadvantages and difficulties. Figure 2 shows the field of fire which results when two mortar groups are combined in one firing position. This picture is considerably easier to understand than the foregoing Figure 1. It shows that the boundary between the two battalions can be protected by all 12 mortars. In the arrangement presented in Figure 1, this was possible for only 8 mortars. Also the sector covered in this protection of the boundaries is larger than that in Figure 1. Therefore, in comparison with Figure 1, these are two advantages, first, the concentrated fire of 12 mortars as opposed to 8 and, secondly, as regards the surface covered, greater protection of the point where the companies join. As a further advantage, there is the fact that in Figure 2, the mortars are working from three positions only, but in Figure 1, on the other hand, from four firing positions. What an advantage this is in the control of fire does not require much explanation. Also, the two other companies which are protected by 8 mortars in Figure 1, are protected by 8 mortars in Figure 2, and with the additional advantage that they are working from two firing posi-

tions in contrast with four firing positions in Figure 1. In Figure 2 it is also shown that one is able to work in front of the sectors of almost 4 companies with the concentrated fire of 8 mortars. The two flank companies of the battalions

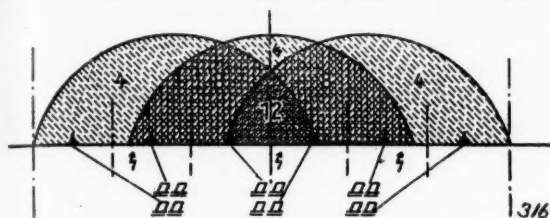


FIGURE 2.

have the fire protection of 4 mortars. That is the same, roughly speaking, as in the system shown in Figure 1, but in this case with the simplification of firing from one position in contrast to two as in Figure 1.

In this second method of employment it is a disadvantage that in each one of the three firing positions it is necessary to combine mortars from two different companies. This is indeed undesirable.

III. The third plan for disposing one's mortars is shown in Figure 3. Here the heavy mortars of each of the battalions are grouped in one firing position. The picture shows an additional simplification as compared with Figure 2. Again the junction point is protected by 12 mortars. In addition we find that firing is conducted from two firing positions only, instead of three as in Figure 2. The entire remainder of the regiment's sector enjoys the protection of 6 mortars. To be

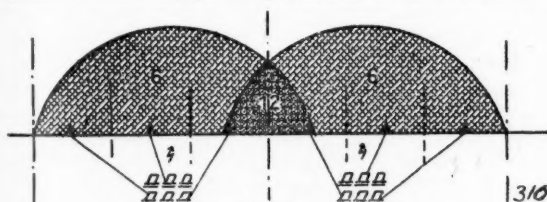


FIGURE 3.

sure, this means that in front of a part of the battalions' sector there is the fire of two less mortars, yet in contrast with the situation in Figure 2, the outer companies enjoy the protection of 6 mortars instead of only 4.

The advantages of firing from one position only are quite obvious, after what has been said in sections I and II. And employing the mortars as discussed in III, one not only saves time but also eliminates all the frictions which would unavoidably occur in the method discussed in I.

But what it means, at the crucial moment, to be able with the least possible delay to lay down the fire of as many heavy weapons as possible at the vital point in a defense battle is well known to any one who has had to do with such defense battles as those in Russia.

So far we have laid the greatest stress on the concentration of fire. We shall now say a few words regarding distribution of fire. Figure 1 may be regarded as the correct example of the disposition of mortars when we are employing distributed fire. Every rifle company has its mortar group behind its sector and the fire control officer is up ahead in the position. The fact that one has a fire control officer up ahead in the position of each of the companies is not altered in any wise even when the mortars are employed as discussed under II and III. Each fire control officer stationed at the front with his rifle company can make use of his mortar group. But if it becomes necessary to lay down concentrated fire in front of any particular sector of the battalion, then instead of two mortars being available at a given moment, there are available all the mortars of the battalion, all controlled by the same fire control. Then with the help of the Model "B" radio

set, there are no difficulties in again distributing the fire over the front of the whole battalion. We are also perfectly free to lay down a barrage at one or two places during the night.

This article has dealt mainly with fire protection and the advantages of the concentration of fire from one position. However, the advantages of this method should also be regarded from another point of view. When the combat strength of the battalion is weak, the depth of the battle position becomes more or less illusory. The firing position of the six mortars, with their personnel of at least 15 men, then forms a very fine supporting point in the rear of the battle position. In the event of battle in the main battle position this supporting point may become an important factor, while it is apparent that a single mortar group with its small personnel would hardly be able to play any great role.

The foregoing observations, coming from my own experience and observation of Russian combat methods, are intended to prove the advantage of the battery-like use of heavy mortars.

## Tactics of Soviet Antitank Riflemen

[Reprinted from the *Information Bulletin* of the Washington Embassy of the U.S.S.R. 26 November 1942.]

THE ANTITANK rifle is used mainly against armored cars, tanks, and in exceptional cases—by special order of the command—to silence artillery and machine guns firing either from open positions or from fortified emplacements. Sometimes it is used against planes.

Careful choice of position is the first essential for making the antitank rifleman's fire effective. He should always be placed so that he dominates an area over which he can maintain effective fire at maximum range—400 yards—in all directions. It is a good idea to choose a position behind antitank obstacles so as to enable the rifleman to hold his prey under flank fire. There should be no outstanding objects near his firing position, nor any dead places in his zone of fire.

Experience on the Soviet front has taught us that the best position for an antitank rifle is the edge of a gully or ravine, in the shelter of felled trees or among low bushes, on the slopes of hills, among the ruins of houses or on the edge of groves and gardens. A position on the forward side of a steep rise is useful, as it allows the rifleman to aim at the rear of the enemy tanks as they slowly climb the hill. A position on the far side also has its advantages, as there the rifleman is beyond the enemy's observation and is therefore less vulnerable to his artillery and mine-throwers. Attacking tanks are an easy target the moment they come over the crest of a hill; the crews, surprised by the antitank rifleman's fire, cannot at once trace the source of the fire.

But wherever the antitank rifleman is operating they must not sit down and wait for the tanks. They have to go and look for their victims, get to close quarters, and put them out of action with surprise fire from flanks and rear.

In trench fighting, where enemy machines manage to smash their way forward, the antitank rifleman should hug the bottom of their trench, allow the tanks to pass overhead, and then open fire on them from behind. The crew of a disabled or burning tank may attempt to escape or show fight, taking cover behind their machine. In such a case the antitank rifleman need the support of automatic riflemen and sharpshooters.

In defensive tactics the place of the antitank rifleman is in the direction of possible tank attacks; it is their job to destroy the enemy machines at the first defense line. In such cases the rifleman are not scattered singly all along the line, but are concentrated in separate groups. Similar groupings of

antitank riflemen cover the second and third defense lines, and are placed inside or between the antitank artillery positions.

Cooperation between the groups is of great importance. The distance between the groups should therefore never exceed 200 yards. In a defensive action the commander of a regiment or battalion usually has an antitank reserve. This reserve can be moved readily to the flank, and its work can be of great assistance in regaining lost ground. Simultaneously, a mobile reserve group of antitank artillery must act from the front. If the shock group of the regiment or the second echelon of a battalion are to take part in an action, the antitank rifle reserves must be moved to the line of departure in good time.

With that object in view, the officers of the reserve are kept informed about the disposition of the antitank defenses, the probable direction of enemy attacks, the direction of counterattacks by our shock groups and the firing positions of the mobile reserve antitank artillery.

In a defensive action, cooperation with other antitank weapons is usually planned as follows:

Groups of men armed with hand grenades and fire-bottles take up concealed positions in front and on the flanks of the antitank rifle group, but no farther than 100 yards from it. Engineers with mines are stationed in front and on the flanks of the firing position, while sharpshooters detailed by the defending rifle units for the destruction of crews of damaged enemy tanks and enemy automatic riflemen take up position at their discretion. The men with hand grenades and fire-bottles support the antitank detachment against any of the enemy who manage to filter through to close quarters. The antitank rifles in turn defend the positions of the antitank artillery.

A coordinated defense by all antitank weapons enables the infantry to hold its own, preventing the penetration of enemy tanks.

When on security duty in battle, the antitank rifles take up positions across the probable ways of approach of enemy tanks, or along the sides of the roads. Their task is to prevent enemy armored cars and tanks from breaking through to our first line of defense. The enemy vanguard is allowed to advance beyond the firing positions, and is then immediately destroyed by the fire from behind. Then the rest are dealt with.

Before an advance begins, the armor-piercers cover the movement of the infantry to their starting positions. Subsequently they move forward on the flanks of the infantry from one objective to another. Their method of advance may be by crawling or by dashes forward—it depends on the terrain and the intensity of the enemy fire. The commanders search unceasingly the hidden routes for the next forward movements.

In defense actions the situation is constantly and rapidly changing. Enemy tanks may launch surprise attacks from cover. Ambushes are frequent. It is therefore of the utmost importance that the antitank rifle detachments should be always on their toes. Those who are fighting in the advance echelons move on the flanks of the infantry in battle formation, shoulder to shoulder with them. If for some reason the infantry is delayed, the antitank riflemen immediately take up firing positions and prepare for battle.

They dig in, camouflaging their movements as they do so. They cover the starting positions, keeping the enemy's front defense line under careful observation, looking for dug-in tanks and destroying them as soon as they spot them. As the attacking infantry break through the enemy lines the armor-piercers quickly catch up and begin immediately to prepare to repel possible counterattacks by enemy tanks.

When they reach the depth of the enemy defense the main job of the antitank rifles is to destroy counterattacking tanks. The armor-piercers maintain their steady advance on the

flanks of the infantry's battle formations in the direction of possible tank attacks, and take up suitable firing positions.

As soon as an enemy defense position—perhaps a height or a village—has been captured, the armor-piercers at once move forward to organize the antitank defense and take up their positions in the direction of possible danger.

The remainder of the antitank rifle units stay behind to protect the Soviet infantry against counterattacks by enemy tanks and to destroy panzers that may be attempting to cover the retreat of their rear-guards.

## German Experiences With Captured Soviet Cannon

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Lieutenant Gabriel in *Artilleristische Rundschau* October 1942.]

IN THE HARD BATTLES on the Donets front I received on 6 February 1942 the order: "You will take over, temporarily, four captured cannon. Report concerning results of fire on 8 February 1942."

To my question as to whether I was to get any sighting instrument, firing tables, or further information for handling the gun, I was answered in the negative. "Woe is me," I thought to myself, "no firing tables!" Without "the artilleryman's Bible" the artilleryman can get nowhere, or so I had been taught in time of peace by my commander and by experience in time of war so far. And besides, these were guns! I was used to howitzers! And yet the order intrigued me somehow.

I took a look at the guns mounted on rubber-tired wheels, with split trail; caliber, 7.62 centimeter; barrel length, 4 meters. An excellent automatic dropping breech-block made the cannon a fully modern weapon (year of manufacture, 1941). The elevation dial with seven different gradations (the scale) appeared very mysterious. What could its significance be? The question also arose, what scale was commonly used by the Bolsheviks? But the last question was not so important to begin with, as I was to use German panoramic sights. In case of corrections for traverse, therefore, no difficulties could arise. But how were changes in range to be managed? That would have to be decided by the firing itself.

I gave my battery officer the orders to proceed to a firing position and went to the observation post in the sleigh. The place I chose was in the front infantry line, about six miles ahead of the firing position. My base line was grid east. The only definite information that had been given me was that the cannon had a range of 15 kilometers [over 9 miles]. After I received the report that they were ready for fire, I had them fire a shot with the greatest elevation (point 300) on the first scale. After an interval of about 23 seconds I heard the report of the gun and a few moments afterward the sound of the exploding shell. I had not heard any humming or whistling of the shell; the maximum ordinate must have been very high. I heard the explosion of the shell far in the rear of the enemy front line. I estimated the distance at about 15 kilometers. And now what we had to do was cut down our range slowly, graduation by graduation, in order finally to be able to observe a burst. And in doing this I had to exercise care. I did not want to endanger our own infantry.

After five rounds, shortening the range each time by 10 or 20 marks on the scale, I was where I wanted to be, at mark 210 on the scale, as the burst appeared on a slope about 200 meters ahead of me. When this shot was fired I heard the report of the gun and explosion of the shell close together. My observation officer called out; "Lieutenant, those are the 'Whiz! Bang!' shells we heard for the first time during our



advance through Volhynia in the summer of 1941!" And so during the next few days we were able to worry the Bolsheviks greatly with their own weapons.

I now had three further shots fired at the same range and found out that the dispersion at this range (the small shell had already traversed a distance of 10,500 meters) was very slight. I estimated the axial dispersion in range at from 150 to 200 meters, excellent work for the cannon which had a very flat trajectory on account of its high muzzle velocity. As I was later told by a prisoner, this muzzle velocity amounted to 704 meters per second.

During the course of the firing I learned by various corrections that at a range of 1000 meters, one mark on the scale made a difference of 50 meters in the range. For corrections in traverse, I made use, for the time being, of the German rule, as I was using my own panoramic sight. Today I have Soviet aiming instruments with a 6000 graduation. The clinometer alterations did not agree, as was the case with German guns, with changes in the elevation dial, since on this latter the distance between the graduations increased or decreased with the range. It was not absolutely necessary to have a firing table for use with the cannon, as in its place we had the various scales.

For this day I stopped firing because visibility was badly impaired by wildly driving snow. The following day we learned the following things concerning the scales:

- 1st scale, for heavy charge, new form.
- 2nd scale, for heavy charge, old form.

- 3rd scale, for decreased charge, new form.
- 4th scale, for decreased charge, old form.
- 5th scale, for shrapnel.
- 6th scale, for antitank shells.
- 7th scale, for firing on aircraft.

The words "new form" or "old form" had reference to the shape of the projectiles. Part of the 7-kilogram shells had a sharp point, the rest of them blunter points. By means of various numbers on the outside of the shell case one could tell whether there was a heavy or light powder charge in them. Besides, I learned that there were three different kinds of impact fuzes and three different kinds of antitank projectiles. The variety in projectiles was due to the fact that they were some of English, some of French, and some of Russian manufacture.

I was pleased with the results of my firing and reported it as successful that evening. Since that time I have fired several thousand rounds and collected, as a result, much other information. My gunners have fired 14 rounds per minute. The regulations called for 18. The effects of the shells were similar to those of a heavy mortar and for that reason the whole battery was soon longing for German guns; in particular for German howitzers. Even though it is possible to trouble the enemy at great range, it is more enjoyable to be close to him and "see the pieces fly." The flexibility of the trajectory in the case of howitzers permits the ones employing them to support the infantry in many other ways.



### The German "Tiger" Tank (T-VI)

IT IS INTERESTING to compare Axis and Soviet accounts of the much-vaunted new Nazi "Tiger" tanks (T-VI) which were used for the first time in January of this year, two of which appear in the picture above.

Of these tanks, *Die Wehrmacht* (Berlin, 14 April 1943) says: "A tank has been built which neither the English, Americans, nor Soviets can match. It is more than seven meters long, over three meters wide, and among other features of its armament it has a long-barreled cannon. Its radius of action is sixty miles or more. The turret may be turned very quickly in any direction. This newest of mammoth German tanks has been provided with a new type of steering system. It is easier to steer than an armored car. It has a steering wheel which the driver is able to operate with two fingers. In spite of the weight of the tank, fatigue is unknown to the

driver. The Tiger has a gasoline motor: the Diesel motor was not used because it is heavier than the gasoline motor. The Tiger is able to carry more ammunition than any known former type of tank. The interior is roomy. The weight of the tank insures easy and accurate conduct of fire. The Tiger affords the highest degree of security. It is not employed mainly as an independent combat unit, but is always accompanied by other tanks and infantrymen affording it flank protection. Engagements have shown that the Tiger is impervious to attack. So far no weapon has been able to damage it. Neither the bullets of the Soviet antitank rifles nor those of the antitank cannon, not even those of the 105-mm artillery, have penetrated its armor. Both the tread and the underside of the tank offer a certain degree of security against mines. The crews of Tiger tanks have suffered no casualties, wounded

or dead, in their employment so far. In addition to being used as a tank destroyer, the Tiger may also be used for crushing. It is able to destroy enemy centers of resistance in houses, for example, simply by traveling through them. It pushes over trees a meter in diameter. In the Tiger the German army possesses a weapon which is superior to any former antitank weapon."

Pester Lloyd (Budapest, Hungary, 17 April 1943) says: "The Tiger tank is characterized in military circles as the *most modern combat vehicle* in use anywhere in this war. The superiority of this new German war vehicle is attributed to the following characteristics. First, its astonishing *mobility* in spite of its great weight, the result not only of a strong motor but also of the *novel construction of its powerful treads* which better distribute the weight of the heavy tank. The superiority of the Tiger is also attributed to its *extremely strong armor*. It is emphasized that its crew is thus offered so effective a protection that during the initial employment of the tank *not a single loss occurred*. The Tiger is said to have traveled *even across minefields* without suffering serious damage from mine explosions. Both British-American and Soviet defense guns are said to have *proved to be without effect up to a caliber of 105-mm and even 120-mm*. Still greater importance is attributed in professional circles to the *great range and the larger caliber* of the Tiger. Its main gun is said to have a power never before mounted in a tank, so that the Tiger is in a position to *fight down the heaviest enemy tank even from a distance* which leaves it out of range of the hostile guns."

Quite different is the account appearing in the Soviet Army journal *Krasnaya Zvezda*, 6 June 1943. Soviet experience both in battle and on the proving grounds where captured Tigers have been tested seems to indicate that the monster is by no means "impervious to attack." Conclusions based on Soviet experience may be summarized as follows.

In constructing the Tiger tank, the Germans paid attention mainly to powerful armament and armor protection, with the result that the running gear is greatly overloaded and is unreliable in use. Because of its weight the Tiger's running qualities are not good and it easily gets stuck in low places. Realizing these weaknesses, the Germans have used the Tiger only from concealment in defense or in the third echelon in attack, making use of its fire power for shooting point blank at Soviet tanks from great distances. The possibility is recognized, however, that the Germans will later attempt to use massed Tigers in breakthrough of defense.

In spite of its powerful armor and armament, all means of antitank combat are effective against this tank provided only that its vulnerable spots are known.

Rifle and machine-gun fire as well as the fire of antitank weapons can smash the optical apparatus in the loopholes of the command turret and the central turret, and also the optical apparatus of the rifleman-radioman and the driver which is located on top of the front part of the tank. Large-caliber machine-gun and antitank-gun bullets, striking in the mounting groove of the turret, wedge it tight so that the tank can no longer execute circular fire.

Antitank grenades and movable mines are effective in putting the running gear out of order (i.e., the front driving wheels, bogeys, tread, and rear-wheel idlers). By throwing antitank grenades or bottles of inflammable fluid on the motor compartment, located in the rear of the tank, it is possible to set it afire and destroy the ventilating apparatus. Concentrated fire of all sorts of weapons should be directed at the machine-gun mounting and at the cannon.

Artillery fire has great effect when directed at the running gear of the tank. If the projectile strikes the driving wheels or idlers the tank is definitely crippled and stops. Tank-hunters must fire shells broadside at the tank, aiming at the cen-

tral turret and the gas tanks on the right and left in the vicinity of the idlers and the two rear bogeys.

The weakest side armor is low down, just a little above the bogeys, forming a strip about 20 to 30 centimeters wide along the whole length of the body. Firing at this area, one can be sure of hitting the crew and the combat section of the tank. The strongest part of the tank's armor is in front. For this reason the best effect is attained by lateral fire of antitank artillery against the sides and rear, using armor-piercing shells of various types. A high explosive shell striking under the base of the turret destroys the top of the tank and puts the turret out of action.

The best way to destroy the Tiger, according to Soviet experience, is to let it come as close as possible, bring it to a halt by means of obstacles and obstructions (which, it appears, is not too difficult, because of the overloaded chassis and the poor running qualities), and then open up on it with surprise fire from ambush.

When on the defensive, the Germans employ the fire of these tanks from stationary positions under camouflage. The responsibility then devolves upon reconnaissance to locate the exact disposition of the Tigers so that concentrated artillery fire may be brought to bear upon them.

It is essential, first, to study carefully the methods of combat employed by the Germans in the use of their big tank, and then to disseminate widely the information concerning the best means of combatting it. For, according to the Soviet report, the Tiger can be successfully combatted by the proper use of all types of fire, whether from infantry, artillery, or special antitank weapons.

## Timor

[From an article by Bill Marien, Official War Correspondent, in the Australian Army journal *Salt* 18 January 1943.]

The story of the Australian commandos in the mountainous wilderness of Portuguese Timor began on December 17, 1941, when they landed at Dilli, the administrative capital, to assist in the island's defense. They had been trained as commandos in Australia.

For two months they garrisoned Dilli as the Japanese swept through the South-West Pacific. On February 1 they learned Malaya had fallen. On February 16 they got news of Singapore's collapse. At midnight three days later the Japanese struck simultaneously at Koepang in Dutch Timor, and at Dilli, and made their first raid on Darwin to blanket Allied air support and cut off reinforcements. The Australian mainland lost all contact with its troops in Portuguese Timor.

For three hours, Dutch troops and the AIF [Australian Imperial Force] commandos opposed the Japanese who landed at Dilli from three transports covered by a cruiser and a destroyer. But by 3 A.M., the Japanese had broken through and moved to attack the aerodrome. For six hours, 20 Australians held off 500 Japanese there, blowing up the runways and buildings before withdrawing into the hills.

Then came the stocktaking. Heavy equipment and surplus clothing had been destroyed, but ammunition had been hidden in the hills—and plenty of it. There had been casualties, not many. They decided to fight on.

Speedily they settled down to their terrain. In their mountain hide-outs, they lived like natives—eating meagre, raw, and unappetising food, sleeping in native huts or in the open, attacked by fleas, lice, malaria, and dysentery. By day they sweltered; at night they shivered.

Often within half an hour's march of the enemy, they were never beyond threat of attack, and were spied upon continually by natives who had accepted Japanese pay, promises, and arms. Under these conditions the commandos developed their

own brand of kill-and-run fighting. For 59 days, Australia thought they were either dead or prisoners; they themselves did not even know whether Australia was still in the war.

But the commandos received unexpected reinforcements—AIF men who had marched hundreds of miles from Koepang, Dutch Timor, when they heard from natives that their comrades were holding out in the mountains of Portuguese Timor.

All the newcomers were in low physical condition, but most had retained their arms. They had not been trained as commandos. Some were specialists and had undergone only elementary training as combatant troops. But all wanted to be commandos: they had to be to survive. So a training school was set up almost within range of Japanese machine-gun fire.

It wasn't theoretical training. The Japanese would interrupt the course and recruits would apply the rifle and machine-gun lessons they were learning. On graduation day the recruits were "marched out," bayonets slung at the belt of vine by native flax. Pistols were carried in holsters of uncured goat skin, knives tied to thighs with native flax, Tommy gun magazines slung from the improvised belts.

#### TYPICAL WEEK

In a typical week in the lives of one batch of commandos I stayed with, a forward fighting patrol is up on Sunday at 5 A.M. They sit down to a breakfast of rice or maize and native coffee brought to them by their creados (young native servants) who give loyal service for a pataca (35¢) a week.

The commandos' job for the next three days is to take a string of pack-horses to Force Headquarters to get rice, coffee—a native brand, good and palatable—some precious salt, and ammunition.

The men go down a mountain track so steep that even their tempered limbs cramp. They carry their Tommy guns, their Brens, and their sniper's rifles as though the weapons have grown on them like an extra arm. They look like pirates—or worse. Behind them, carrying their pack and blanket, swing the creados, the effortless, tireless natives.

The party comes to a secluded spot where the native aussilliers (owners of hired horses) have gathered over-night. The tiny Timor ponies, for all their smallness, can carry heavy loads for long stretches over tracks that would kill an Australian horse. The commandos issue a stream of orders in the native tongue. The aussilliers fix hempen bridles and lead-ropes to their horses. The caravan moves off.

The sun beats down cruelly. Horses and men drip sweat. There is no halt for lunch—there is no lunch. They make their way down a river bed which twists through rocky canyons rising sheer on each side. They trudge shin-deep along a quickly-running, ice-cold stream.

In the afternoon it rains. They speed up to get to the mountain track again. It is death to be caught when the rains flood down the little river at breakneck speed in a dirty flood six feet deep. But so steep is the river bed and so anxious are its daily flood waters to reach the sea that the stream is normal four or five hours after the rain has stopped.

The track leaves the river and goes like a ladder of dirt up an almost sheer mountain side. Coral rock, sharp and poisonous, is the basis of the track. The horses, even unloaded, have to grunt their way aloft. Breath is painful relief when the men get high and the air is thin and cold. Only the natives don't seem to mind. But over a long trek lasting for days, the Australians' pace would kill a native.

After walking from 6 A.M. to midnight, the pack train stays the night in a native village. On Monday they reach Headquarters. After eating goat or buffalo meat and rice, and drinking coffee made white by buffalo milk and sweetened with native honey, they stay overnight.

Late on Wednesday they regain their mountain hide-out after four days of continuous walking, of hiding from con-

stant Japanese reconnaissance planes, particularly a persistent plane known as "chaff cutter" or "the peanut roaster."

On Thursday, patrol. They may have received advice that a Japanese column, 250 strong, is moving from one spot in such a direction. The Australians deduce that the column is going to occupy a certain village. They know the mountains as well as men can know anywhere that means safety, and where they have found comparative security for 10 months. They decide to ambush.

Choosing a ridge below which the Japanese must pass, they cut straight across trackless mountain bush. They select their point of ambush according to cover and terrain—50 feet or 500 yards from the track. They must be more careful than in the early days. Learning from their many defeats, Japanese now move in two columns. The second might be behind the Australians who might themselves be ambushed while making their getaway.

The Japanese in their greenish uniforms, are in sight, jogging along in the manner of coolies—short, quick steps, their arms swinging jerkily across their bodies. There is no march discipline. Bringing up their rear, a number of Timor ponies carry parts of a mountain gun designed for extraordinarily rapid assembly. The troops themselves carry mortars, three-inch and 20-mm, pistol guns, rifles, and machine guns.

Into range. A fusillade of shots, and the front and rear of the enemy column collapse in a screaming mob of dead and dying. The Japanese who survive show amazing speed in getting to cover and returning fire. But their aim is usually inaccurate.

The Australians retire to a previously-selected knoll on the other side of the ridge. In ten minutes the Japs appear against the skyline of the ridge. An officer arranges the setting up of a machine gun, but the Australian captain picks him off.

Infuriated, the remaining Japanese charge down the hill with no thought of cover. The Australians, putting up terrific fire, stop the rush. Then bowing to numerical superiority and relying upon intimate knowledge of the mountains, they steal away. They have inflicted heavy losses.

That night, as every night, the Australians mount double guard—not only as protection against Japanese but against natives won to the enemy by a combination of fear, useless Jap money printed on the spot, and promises of looting and rapine.

Friday they are out on patrol again or doing reconnaissance work. Saturday is the same. That is a week with a forward fighting patrol—the more spectacular and dangerous job, though it would not exist without the L of C (Line of Communications) troops and signallers.

Not all of the raids are made by organized parties. One of the many examples of lone-wolf tactics was a raid by a lieutenant on a Japanese-occupied village. Dressed as a native, he walked into the village and tossed hand-grenades into a hut in which thirty Japanese were sleeping. When the survivors rushed out, he sprayed them with a Tommy gun, then made a successful getaway.

#### THE NATIVES

Without the good will of natives, the commandos would not be able to hit so hard and so often. Although many natives have been bribed or terrorized into Japanese service, many others are loyal to our men, who rely upon them for much food and information and all heavy transport.

The Timor native is vastly different in physique from his New Guinea neighbor. He has amazing endurance and once a load is lifted to his head he can keep it there indefinitely. Rarely taller than five feet, he lives in small, closely settled villages—collections of bamboo and thatched huts.

The natives' traditional weapons are spears, bows and arrows, blow-pipes, and swords, which, since Japanese will has



been imposed on a section of them, have been discarded for rifles and Tommy guns.

War has sorely disrupted the Timor native. The country is threatened by a famine. But the Australians have made a point of treating well every native not hostile and who does not attempt to murder them. Australians have fostered the planting of new crops. Magnificent friendships have sprung up between the Australians and their creolos, who more than once have saved the life of a commando.

The Australian commandos are hedged on three sides by Japanese. Night and day they are patrolling. Any twist of the track may bring them smack into a superior Japanese force. Death may come from the spear of the native who pretends to be friendly. Malaria wrecks many of them, and vile-tasting buffalo meat and monotonously sticky rice are no invalid diet.

The commandos are young men. They have not drawn pay; many have no pay-books. Few of them are over 25, few married. They are tough.

## Men of the Supply Train: Soldiers of the Front!

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Kallmerten, war reporter, in *Stettiner General Anzeiger—Ostsee Zeitung*, Stettin, Germany, 19 January 1943.]

THE CORPORAL lets the dipper and dish fall from his hand, jumps from the truck, and lies flat beside the left tread of his vehicle. The Soviets are firing from the mountains on the position of the light antiaircraft guns engaged in helping block the valley. The enemy observers can, to be sure, survey the terrain from the Caucasian foothills, but the supply train lies well camouflaged on a small elevation covered with low bushes. To left and right, in front and behind the guns, the shells strike, clods of earth fall on the men and splinters whirr through the air, but the "whiz-bang," as the gunners call the hostile weapon, has no more success than to cause us to curse the shooting and to sprinkle our uniforms with an earthy gray. The corporal turns back to his equipment grumbling, and dishes the food into the mess kits of his comrades.

A hundred times, or perhaps twice as often, he has made the trip from the battery combat supply train to the platoons, bringing to the gun crews and to the command post their provisions and mail. No sort of weather has hindered him, no bombardment of the road, which often left him no alternative but to step on the gas in spite of the shell holes and to drive as hard as the machine could stand. He can tell of salvo guns [not understood.—Ed.] and hostile dive bombers who attacked his vehicle with their guns on his daily trips up front. Once they shot up kettles and mudguards, but otherwise everything went well; his "army supply car" kept on bringing up food and mail as on the first day, and helping to hold his comrades' bodies and souls together. Often he was late, but then the joy was all the greater when he pulled out the ignition key and shouted: "Come and get it—get your mail—canteens for brandy!"

About twelve miles behind the front line lies the supply train as first support of the light antiaircraft battery which points its guns, just behind the main line of resistance, at the advancing Soviets. Here stand the vehicles of the supply train. Here there is water and wood enough on hand for the field kitchen which starts work early in the morning before even the first roosters crow. At nine o'clock comes the corporal's vehicle for the trip to the front. In the afternoon, when the sun sets behind the mountain wall, it returns. The corporal reports to his first sergeant and transmits to him the wishes

of the men at the front, the needs of his comrades, and the orders of the battery commander, and mail for home is passed on to the detachment and then to the nearest field post office. With him are two men on furlough who are waiting for travel orders and assignments on the furlough train. Only on the following day they continue the long journey; for this night the corporal takes them to his quarters. Place will be found somewhere. He himself will have to get up twice during the night to stand guard. The supply train is a small combat group in itself and must be protected against unpleasant surprises. The men have often had to defend themselves with weapons in their hands, for isolated troop units of Bolsheviks and guerrillas move about in newly occupied territory and a supply train is a nice morsel for them.

The supply train carries everything that the fighting troops need. With the train is the sutler, who is in great demand for his goods. And the repair unit, headed by the supply sergeant, also belongs to the supply train. The much discussed Russian roads torment the treads and wheels of the vehicles; the mechanics in their meagerly-equipped working places always have plenty to do to repair minor damage. Now, since the rapid advance has stopped in the winter season, troubles are less great than in the summer months during which the repair squad followed the battery and took care of every vehicle that showed signs of failing. Often the supply sergeant was left behind on the road with only two or three helpers who, threatened by hostile squads to right and left, kept on patching and repairing and then hurried to rejoin the column.

The drivers, the auto experts, are the masters in the combat supply train; on their shoulders rests the responsibility summed up in the first and last command: Drive, drive, drive. They sit on the ammunition trucks, drive back and forth between the column of the artillery battalion and its platoons, and bring ammunition for the guns which have proved themselves magnificently in many ground battles and which cause the Red fliers to give up all low-altitude attack. The trip with ammunition trucks, as also with the trucks bringing up the indispensable fuel, is dangerous. And among the imperturbable drivers are the motorcycle messengers who always find a narrow path on the unimaginably bad roads along which they balance their way between platoons and the battery command post, from there to the battalion, and back again to the supply train.

They are all fighters, primarily against the Russian highway. They furnish the necessary materials to those who are forcing their way eastward, they transmit the orders of the command when the men with the wires cannot follow or when the current fails, they provide what the vehicles, the guns, and the men need in order to be victorious. They are blunt and full of strength, for their service is difficult and demands real men. They are front-line fighters in the best sense of the word, and all of them together make up the supply train of the battery, they and the men of the field kitchen and the provisions trucks.

## Armored Artillery In the Soviet Campaign

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Captain Duic in *Artilleristische Rundschau* September 1942.]

*The following description is based entirely on notes by the author. Our artillery battalion was the 2d Battalion of the armored artillery regiment of a Thuringian armored division.*

THE TANK BATTLE NORTH OF KOVNO 25 AND 26 JUNE 1941.

ON THE EVENING of 23 June 1941 the armored division had formed a bridgehead on the east side of the Dubissa (see Fig-

ure 1). The next morning the combat group to which our light battalion belonged as advance guard hurled back the enemy, about a reinforced battalion in strength, toward the northeast. And then, for reasons that we did not understand at the time, our combat group was halted and turned off at a right angle toward the southeast. But on account of the necessity for a new disposition of our forces and for reconnaissance and improvement of the roads, our combat group



FIGURE 1.

was not able to start out in the new direction until late in the afternoon. Since the roads continually had to be put in order as we advanced, we did not reach the Rossieny-Shadov highway at Vosiliskis until the early morning of 25 June, having made no contact with the enemy.

When we arrived here we found the situation to be as follows:

On 24 June the neighboring division on our right, after a series of engagements of varying success, had succeeded in crossing the Dubissa northeast of Rossieny, throwing back a strong force of enemy tanks, and forming a bridgehead.

Our own division, with security thrown out against attack from the direction of Shadov, was ordered to take up a position at Vosiliskis in front of the enemy force which, on 25 June, was to be driven farther back toward us by the neighboring division. We were then to cooperate with the other division in the enemy's annihilation.

This plan was favored by the fact that there were extensive forests in the hills southwest of Vosiliskis which would prevent the enemy from making use of his motorized forces and also from escaping toward the southeast. These woods were impenetrable.

This terrain was particularly favorable to our division for carrying out this blocking operation. The position immediately occupied by the advance guard on the heights a mile and a quarter southwest of Vosiliskis dominated the highway over which the enemy had to arrive (see Figure 2). To the right of the position lay a lake several miles wide whose shores were covered with reeds. The swampy land bordering the position on the left, which farther on turned into forest land, was to a large extent impassable for vehicles employing either wheels or caterpillar tread.

The battalion set up its command and observation posts on a hill southwest of Vosiliskis. It provided a good view over the terrain which was almost entirely open and which rose

gradually to the edge of the opposite forest. The firing positions were echeloned to the right and rear toward Vosiliskis.

The battalion command post had just been occupied when the following message came in, picked up by the aviation radio station from a divisional reconnaissance flier: "Our own tanks approaching over highway from the southwest." This

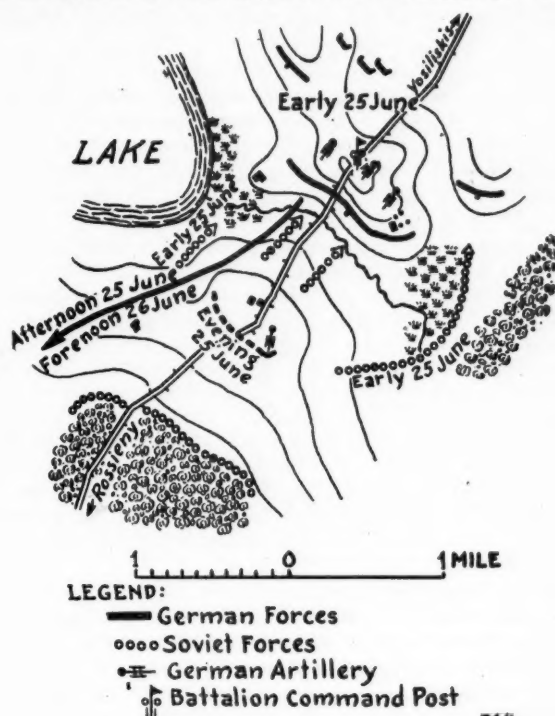


FIGURE 2.

did not exactly fit the situation as it was then known. Had the enemy escaped from the trap? When a little later the message was confirmed by the regiment, uncertainty still remained.

Almost at the same time one of the batteries reported activity on the edge of the opposite forest. Vehicles could be seen at the point where the road left the woods, and yet on account of poor light we were not able to tell even with the observer's telescope whether it was friend or enemy. It was impossible to give the order to fire which the batteries desired. The situation was not cleared up until a tank came out of the woods and came roaring at top speed toward our position. It was the enemy. The battery fire was too late. An anti-tank cannon belonging to the rifle troops cut loose. Unmindful of it the 52-ton tank continued on its way over the highway through our lines and past our observation posts. It was our first meeting with these monsters. Only when the tank was far to the rear, and shortly before it passed our northeast line of outguards, was it set on fire by an antiaircraft cannon.

An attack by stronger forces of enemy tanks was expected at any moment. Consequently a cannon from each of the batteries was placed in position as quickly as possible on the hill in the vicinity of the observation posts for defense by direct fire. Shortly after this the attacks by the enemy tanks began. Various types of tanks, mostly in small groups, attacked us. Our guns now began to fire, at first at long range. When the Bolsheviks noticed that the German defense was getting stronger they attempted to make detours, but this was unsuccessful on account of the marshy terrain and our defensive fire. While this was going on, one of the battalion's batteries with all its guns had been brought up to a position in the open, for it had become evident that de-

structive effects could hardly be expected from a covered position.

In the attacks that had occurred we had opened fire most of the time at too great a range probably for the reason that the breakthrough of the first tank had somewhat unnerved us. For this reason, some of the guns temporarily lacked ammunition, and strict firing discipline was ordered and careful fire control practiced even in direct firing.

From the whole action of the enemy it was now clear that we were dealing with an opponent who hardly knew what his objectives were and who had become disorganized by retreat. But on the other hand the crews of some of the tanks fought unusually hard and stubbornly. They were Mongolians whose fighting nature had apparently in no wise suffered from the veneer of technical instruction.

In the meantime all three batteries of the battalion, acting in a very exceptional manner, had taken up either half-concealed positions or positions in the open just behind our own front lines. This was certainly an advantage in preventing strong attempts at a breakthrough. The enemy fire came from the tanks only, and although it was from cannon up to 150-mm in caliber it was not concentrated and for this reason was not very effective. Besides, most of it was too high and went over the top of the hill and into the area beyond, merely causing our forces to move the limber positions. The enemy also seemed to lack ammunition for the larger calibers. Since our batteries dug in deeper at every lull in the firing, they were able to stay in their highly dangerous positions with no troublesome number of casualties.

Enemy rifle troops, also in small groups, had advanced with their tanks and found shelter behind rows of shrubbery and in grain fields. They did not come to the point of attacking us seriously but established themselves firmly in the farm ahead of our right wing and fired from this point with light infantry weapons on the right wing battery of our battalion. The latter, therefore, set the building on fire with its shells and our infantry troops drove the enemy away.

Early in the afternoon a tank regiment belonging to our division launched an attack against the open portion of the opposite hill in order to drive the enemy back into the wooded area and increase the confusion which was already obvious in his ranks. One battery of the battalion accompanied the tanks. This was done according to previously arranged plans whose requirements were practically satisfied by a small number of the best all-terrain vehicles. The remainder of the battalion and a heavy battalion supported the attack from their previous positions by means of armored observers who accompanied the attack. The attack made good progress. Merely by the impression they made on the minds of the enemy, the tanks and the accompanying battery saved us from casualties. However, when they were finally ordered into position by the battalion commander, who was also accompanying the attack, they suddenly found themselves in the effective fire of rifle troops who were scattered over the terrain, and were forced to use machine guns and cannon as well to hold the enemy in check, and in this situation some of the effectiveness of the artillery fire was lacking.

After the mission had been completed the armored regiment took up a position about half way between our front lines and the edge of the woods where the enemy was, and on both sides of the highway, in order to limit still more the area in which the enemy could move and to be able immediately to lay down destructive fire on targets on the edge of the woods. The accompanying battery supported the left wing of this position which had a right angle turn in it. It found, in this manner, a broad field in which to operate and successfully combatted enemy tanks on the edge of the woods as well as new enemy attempts to go around the left flank.

A withdrawal was made from this advanced position as darkness began to fall. In a surprise move and, judging by

the previous handling of the engagement by the enemy, probably by chance, the Russians seized this moment of weakness to plunge violently after the battery. However, in the poor light and in the great amount of dust that was raised, they were not able to do any considerable harm. Unfortunately this attack could not be effectively combatted by us and it marked the start of a whole series of attacks that lasted throughout the night.

Apparently the enemy had waited for darkness to continue his attempts at a breakthrough with more hope of success. It was one of those well-known light northern nights. At short distances we could merely make out the dark forms of the Soviet tanks. Then the flash of their guns confirmed our suspicions. Since on our side both the rifle and the artillery troops were dug in, our casualties continued to be small. Also, probably because the sighting apparatus of artillery is better than that of tanks, especially at night, these duels, in which our antitank troops also took part, resulted without exception in our favor. Only one of the Bolshevik armored vehicles, which had been able to approach the German lines without any noise in contrast with the tanks which used steel tracks, succeeded in breaking through our positions on the highway until it found the latter blocked with German vehicles and was recognized and disabled with hand grenades.

Time and again the terrain was lighted up by a burning tank. With the roar of the guns was mingled the noise of the motors of tanks which had attempted to go around us and had got stuck in the marshes. We had had no rest at night since 21 June and we got no rest this night either, but when dawn came the number of burned out tanks lying out in front of our lines had increased considerably. There were even extra-heavy tanks among them.

On this second day of fighting, 26 June, we were to join forces with the neighboring division. For this purpose, during the morning the armored regiment and the rifle troops again launched an attack across the bare hills occupied by the enemy. The batteries remained in their positions and at first supported the attack by means of excellent fire designed to hold the enemy in check. The fire was laid down on those portions of the edge of the woods which were in view of the firing positions. Later on, after the attack had made steady progress, fire controlled by armored observers was transferred to the western edge of these woods from which there was a threat of attack against our flank. And so we succeeded in establishing contact with the neighboring division. The enemy was now finally confined to the area of the woods. After leaving forces as security in front of its western edge, the rifle troops made ready to launch an attack from the northeast into the forest itself. However, the battalion received the order to continue its march in the original direction as the advance guard of a new combat team, after having fought for two days with the front completely reversed.

These actions were mentioned in the army communique, under the title of "Tank Battle North of Kovno," as having been particularly successful. They had given rise to the unusual situation of all the batteries of a battalion fighting for a considerable period in open positions. As far as the battalion was concerned, these engagements, with the destruction of the Bolshevik tanks, produced a valuable result in that our gun crews became imbued at the very outset of the eastern campaign with an unqualified feeling of superiority in tank encounters, so many of which were to occur later.

## Street Fighting in Stalingrad

[Reprinted from the *Information Bulletin* of the Washington Embassy of the U.S.S.R., 26 November 1942.]

THE BATTLE for Stalingrad, which continues day and night with heavy casualties on both sides, has furnished many ex-



amples of skilfully conducted street fighting which aims at wearing down and exterminating the enemy.

Street fighting is in-fighting. Sometimes the distance separating the belligerent forces is only a few yards. Very often battles are waged for a house, or even part of a house. Then the fighting assumes a hand to hand character. Consequently, the hand-grenade, bayonet, and incendiary bottle play a big part in street fighting. These weapons are being effectively used by the Soviet troops defending Stalingrad.

Street fighting tends to split up into numerous small engagements. Often enough a single soldier, well entrenched in a cellar, attic, or a window in a corner building, may keep a considerable stretch of the street under fire, inflict heavy losses on the enemy and himself remain sheltered from the enemy's riflemen and tommy gunners. Naturally, the direction of fighting of this character is no easy job and the commander must be sure of the fortitude of his men and their ability to make decisions independently. To facilitate this, every man should be familiar with his own duties and the duties of his unit.

Street fighting demands the intelligent disposition of men and firing weapons, and close coordination with artillery and tanks, also bold maneuvering and counterattacks. If all these conditions are fulfilled, the enemy is unable to advance a single step. A fine example of adaptation to conditions of street fighting was shown by a company commanded by Lieutenant Lukyandikov, which held and defended a street. Cellars were fortified and adapted as firing positions; the system of defense and the disposition of firing positions was calculated to permit the all-around repulse of enemy attacks. Observation was not relaxed for a moment. The Germans tried again and again to break the resistance of Lukyandikov's company, but without success. Under cover of night, groups of three or four tommy gunners endeavored to filter into the company's area, but they were exterminated by small groups of Soviet automatic riflemen and grenade throwers.

The Germans usually focus their attention on strongly-fortified centers of resistance, such as street intersections, where fierce fighting proceeds for three or four city blocks simultaneously. Every house and street booth, even an overturned motorbus, is converted into a firing position. Such points are the focus of attack of German aircraft, tanks, machine guns and artillery, under cover of whose fire their tommy gunners try to filter through, creeping from house to house and from one pile of stones to another. As soon as they capture a house they try to fortify it. Buildings which have survived bombing and fire offer the best vantage points in street fighting, and stubborn engagements are waged for their possession, both sides bringing up trench mortars and light guns which are installed inside the buildings.

Stalingrad's defenders take advantage of every position for the purpose of waging an all-around struggle. In street fighting, individuals or bodies of men are often besieged or blockaded. Buildings are adapted in such a way that firing may be continued even if part of the building is captured.

At one intersection fierce fighting developed. The Germans hurled superior forces against its defenders and managed to advance along the streets. They captured the first floor of a brick corner house and evidently decided that the intersection was already in their hands. But the Red Army men defending the house displayed supreme fortitude and tenacity. They barricaded the entrance to the second and third floors. On the top floor they placed two machine guns and began to rain fire down on the Germans. Establishing a fire barrage along the streets they cut off the German tommy gunners from the reinforcements entrenched on the ground floor. The Red Army men held on stubbornly, resisting all attempts to dislodge them with grenades and automatic rifles, until our troops counterattacked and drove the Germans back.

The first attack of the German tanks was repulsed by anti-

tank riflemen firing from trenches, but the Germans then opened intense fire from buildings they had recaptured and forced the antitank riflemen to retire. Firing weapons also had to be withdrawn. Some of the antitank riflemen took up positions in the lower floors of buildings and kept the street under cross fire. Automatic riflemen covered the approaches to the barricade in a similar manner. Barricades made of sandbags, as here demonstrated, stop shells from German tank guns. The sacks might tear and the sand scatter, but the men were not hit by the shells. At barricades made of brick, on the other hand, men were injured by splinters of brick and mortar flying in all directions.

When the German tanks, escorted by infantry, dashed forward, scores of grenades were hurled at them from behind the barricade, while Soviet machine gunners and automatic riflemen fired down upon them from above as well as through embrasures in the barricade. The German infantry was compelled to retire, but one tank kept on and tried to force its way through an aperture in the barricade. It had half succeeded when it was set afire by incendiary bottles.

## Bombing: The Worm's-Eye View

[From an article by Lieutenant-Colonel G. T. Wheeler in *The Journal of the United Service Institution of India* October 1942.]

*This article is based on collected evidence which has been sifted and collated with the help of a little personal experience. The author makes no claim to have suffered all the indignities which would be necessary to render the article entirely first-hand.*

AERIAL BOMBARDMENT and ground-strafting of troops has played such a large part in land operations during the present war that any knowledge which can ameliorate the lot of the target is worthy of study. The necessary knowledge divides itself broadly into two subjects: the methods used by enemy aircraft and the countermeasures which should be taken by troops.

The methods used by enemy aircraft naturally differ for each of the three main types, viz., normal bombers, dive-bombers, and fighters. It is, therefore, necessary that troops should learn to distinguish these types very early in their career. The formations in which they fly and the tactics they employ help one to recognize each type.

The normal bombers, which include the high-level and low-level bombers, work in a deliberate manner, and their target is usually a well-defined installation which has been selected some time before the raid. It is very exceptional for level bombers to engage an opportunity target such as a battery coming into action. The reason for this is that it is far more difficult than the soldier believes for a bomber formation to fly over an area and select and bomb any suitable target that may happen to be there. So many mistakes are liable to occur that such an operation is not usually attempted. There are, in any case, plenty of permanent targets in or behind any battle area.

The high-level bomber is more disturbing to troops than the low-level formation, because the target area is harder to determine. Bombers at 18,000 feet passing over troops, even a mile to one side, will cause some apprehension; they have a horrid look of being right overhead. In fact, of course, the higher the bombers the more certain is it that their target is well-defined, and the less need for the small unit or individual to worry. The low-level bomber is probably after some target which is rather hard to see: a small headquarters or a collection of concealed vehicles. Bomber pilots do not risk

light AA fire and having our fighters on top of them for no reason.

Level-bombers' targets are usually selected either as a result of aerial reconnaissance or from information supplied by ground troops or fifth columnists. Troops that have been caught congested by a reconnaissance plane or flight will become possible objects for later attack. Similarly, troops engaged with the enemy who see their opponents moving clear of them for no apparent reason have probably been notified to enemy bombers as a target.

Dive-bombers are manned by pilots who have been specially trained to engage targets of opportunity. They come over at about 10,000 to 15,000 feet and dive on any good target within their area. The direction of their dive cannot be foreseen until it starts, so very little warning is given of their attack. In one way this has mental advantages, for the awful ordeal of seeing slow bombers grinding up towards one is avoided; the raid is over and finished with restful speed; in all other ways the event is somewhat shattering!

The dive-bomber has very little control over his aim once his dive is fairly launched, and has practically no power to increase the steepness of his dive; so if a moving vehicle is the target, it should be turned and driven hurriedly towards the diving plane in the hope of passing under it. This is a counsel of perfection which can seldom be followed, though it has been by armored vehicles in the desert. The German dive-bombers usually come down twice in fairly quick succession on to the same target. The interval between the two attacks is about a minute, and that minute can often be spent very profitably by those who have been caught lying in the open.

Fighters attack from low level, very low, with machine-gun or cannon fire. Their target is usually a vehicle or vehicles moving on a road. They, also attack twice or even more times. They are seldom alone, so the resultant attack from the target's point of view may seem a rather prolonged event. The attack is more horrid if made by two-seater fighters because the rear-gunner joins in as the machine pulls out of its dive, and for some reason he seems to be more deadly than the pilot.

Now let us see what general rules can be formed from these facts and tendencies of enemy aircraft:

- a. New arrivals in any area need not worry overmuch about level-bombers, unless they are in some permanent target area, such as a railway station or dump site.
- b. The higher the bombers the larger the target, so only very obvious targets should stop work when these pass on their way. It is of course only human for each individual to regard himself as very large and very obvious whenever enemy aircraft are overhead, but this thought must be combatted.
- c. Troops who have been caught in good target formation by either enemy reconnaissance aircraft or by enemy ground troops will lengthen their lives if they spend the next twenty minutes reducing their target value.
- d. All troops who can, should disperse when enemy dive-bombers are about. Batteries of artillery should, if possible, avoid these periods for coming into action.
- e. Enemy fighters are harmless to troops as long as they keep high. When they fly in low or start to swoop they are probably after vehicles, so drivers should take some avoiding action. Vehicles, using roads within range of enemy ground-strafters should carry an air sentry, as the driver can neither hear nor see approaching planes.

We now come to the various methods which troops can adopt to save casualties from enemy air action.

The first essential of air defense is a warning system suited to the local conditions. Any form of siren or hooter is quite out of place anywhere except in very large headquarters, and even there it probably does more harm by stopping work

than it does good by preventing casualties. If heavy AA fire is available it is an ideal warning system. It should be the signal for roof-spotters to take posts, and not for a general stampede. When the roof-spotters see that the enemy aircraft are flying straight towards their headquarters they blow a whistle and the staff disperse with speed and dignity to their trenches or shelters. Dignity in an air raid is as essential as restraint in love; if either is missing, the event is apt to become chaotic and will be followed by regret.

Bofors and light automatics cannot engage high bombers, so their fire is not a reliable warning system. Nor is it fair on the gunner to use it as such, for the last thing one wants is to give away an AA gun position prematurely.

The most suitable warning system in a corps or divisional headquarters is whistle blasts by an air sentry. The warning should be given when enemy aircraft are seen to be approaching, and should not wait for the attack to develop. The action taken will, in practice, be for everyone who is not urgently engaged, say telephoning, to come outside and look up.

Those that are unoccupied should walk towards the more distant slit trenches, leaving the closer ones for the last minute rush of those who are more busy. When the attack develops all take cover as best they can, remembering that it is far safer to be lying down in the open than running for a trench at the moment that a bomb bursts. It is, of course, better to lie in a slight depression or ditch rather than on flat ground.

Small headquarters and troops in action normally work to a whistle alarm; but since they cannot do much about it their chief warning system is the bomb itself. This is more satisfactory than it appears at first sight, because a bomb, by its scream, will give anything between three and ten seconds' warning, and one can do a lot in even three seconds when one's heart is in the job. A bomb that screams on a level note and at a fairly constant intensity is safe, because it is some way off. When the scream sounds something like an express train coming out of a tunnel, i.e. with greatly increasing intensity, then it is going to fall close and very rapid action is recommended. In practice it takes a brave man to do nothing even when the bomb scream is constant.

For all that has been said and written in official manuals, troops who have suffered much from enemy air action will not open fire on enemy planes with their rifles. They fear that it will attract unwelcome attention. In the case of Bofors guns this may be true; but any airman will agree that a pilot simply does not know when small arms fire is opened on him, so he cannot be influenced by it into retaliation. This fact should be more widely spread, for it is either not known or not believed.

The part that slit trenches play in air defense is possibly exaggerated by the mental comfort that they give to the majority of people. There is a minority which prefers a small ditch or even the open country to a trench; their preference is probably based on a desire to be alone, which is understandable. Slit trenches undoubtedly provide almost complete protection against anything but a direct hit by a bomb and the machine-gun bullets of a steeply diving aeroplane. A ditch is about equally effective against bombs but not so good against bullets. The open country is a good bet against bombs and an unlikely target for machine-gunning.

Sitting in a slit trench is something of an art. One should not lean against the sides, because a near miss will deliver a tremendous shock to the spine if one's back is against the earth-side of the trench. One's head should be below ground level, but not so low that it can be buried by a near miss. Lastly, if the bombs are falling close, one should cover the ears with one's hands to avoid the shock of blast on the ear-drums. There is a belief that the mouth should be open, and it may be right.

The problem of the motorist when faced with ground-strafting is largely unsolved. In the desert the drill is fairly well established. As soon as the enemy aircraft looks like attacking, the vehicle is put in full-lock to one side or the other and stopped as soon as possible. This is usually sufficient to avoid the first attack. The occupants then dismount hurriedly, run some thirty yards from the vehicle and lie down preparatory to the next attack.

At one time in the desert an attempt was made to picket all main roads with permanent air-sentries, who, posted on all available prominent hills, hoisted a red flag when enemy aircraft were about. The idea is good, and might well be applied to the main traffic routes of less open country. The lone motorist is quite powerless to spot enemy aircraft, and the noise of his vehicle prevents him from hearing them. The roof-spotter which most vehicles carry has a tiring job and it might well be economical to adopt permanent road air-sentries. It would certainly be very comforting to see a sentry with his flag down as one approached a long straight stretch of road. It would relax the nerves of the drivers, which get very taut under constant air threat.

Let us summarize the main facts which concern the individual's protection from air attack:

a. The warning system must be designed to suit existing conditions, and the over-riding factor is usually the avoidance of stopping work unnecessarily rather than producing a timely warning. In the case of troops that have suffered much from the enemy air force and seen little of our own, the warning system might well take the form of a signal for "own aircraft—resume work" only; for such troops will need no warning about enemy aircraft.

b. Slit trenches should be dug with an eye to those who will have to use them. There should always be one close to a telephone, and sufficient close to a wireless set for all the operators. As many as possible should be concealed and distant from the main target, for the German particularly will regard slit trenches as indication of a target. In one famous headquarter site in the desert it was a point of honor for all who occupied it that no slit trenches should be dug. That site was never bombed.

c. Troops who have had much experience of being bombed, may have learned a lot about taking cover and interpreting bombing and aeroplane noises, but they will not, on balance with morale, be improved thereby. Some soldiers do improve with experience, but most do not, because constant bombing breeds a fear that induces irrational action.

If ever it were true to say that the moral is to the physical as three is to one, it is true regarding enemy air action. The actual physical damage done by bombing is usually negligible, sometimes considerable, but never disastrous. The moral effect of constant enemy air superiority is usually disastrous and always considerable. This has been proved in Poland, Greece, Crete, Malaya, and Burma; and to some extent in France.

When troops have become shaken by air action, the first thing to do is for officers to display, and insist on, dignity during an air alert. Men must continue at their jobs as long as possible and then walk, not run, to slit trenches. Officers must be prepared to stand up as long as possible, and lie down in the open when the time comes. Officers who have to do this should choose the softest possible ground to walk about on, because a bomb bursting in soft ground does most of its damage upwards, not sideways.

Defiles, such as bridges, should be picketed with reliably stolid officers or sentries who can make encouraging remarks to the men as they approach the defile.

After a raid officers should talk to their men and let them admit any fear that they felt. It relaxes the nerves and helps a lot for the next raid.

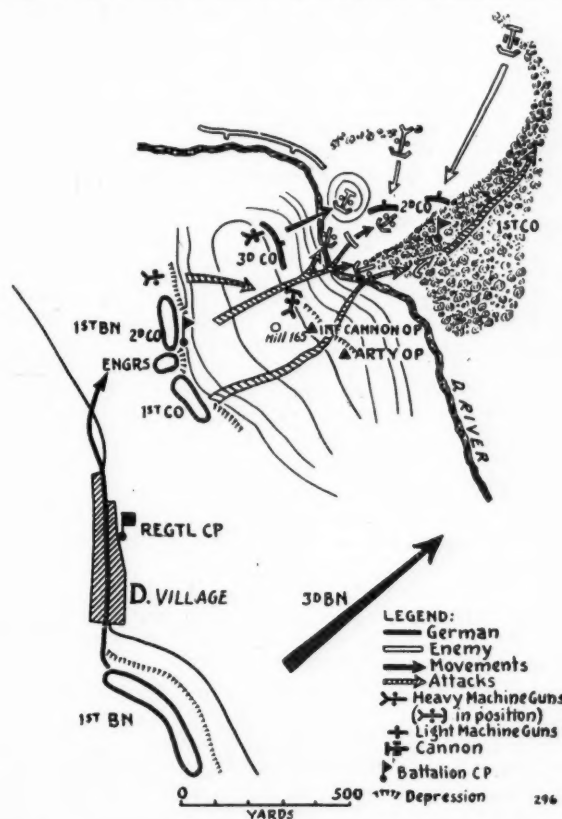
## Attack Across a River

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Militär-Wochenblatt* 4 December 1942.]

**NOTE:** It is regrettable that this interesting problem ends so abruptly and does not develop events as they occurred later—this is characteristic of many German articles. Despite this it is believed that both the problem, and particularly the lessons which it brings out, are of considerable value.—THE EDITOR.

**SITUATION:** Enemy defends himself in field positions on the east bank of the D. river opposite the reinforced 3rd company. By means of observation and combat reconnaissance at least four machine guns, several rifle nests, and one cannon have been recognized. Reinforced 1st battalion (less reinforced 3d company), with the 3d battalion on its right, with no contact on its left, has reached the gravel pit south of village D. with the order to get ready on the evening of 10 July in the area west of Hill 165 for an attack across D. river early in the morning of 11 July.

For purposes of instruction, the lesson is to be studied from two different points of view: as a map maneuver and as a lesson in combat firing. Combat firing across a river is always particularly instructive and the source of a great deal of enjoyment for the troops. In order that the firing may always really fulfill its purpose, the technique of or-



ders and tactical principles are previously discussed on the terrain. In addition, the subsequent combat practice with loaded ammunition is to be given free rein as far as possible. The engagement is conducted in accordance with the wishes of the instructor through the use of umpires and combat assignments.

The following short description of the engagement serves the purpose of illustrating a forced river crossing with its many difficulties and obstacles.



The battalion, advancing in file over blockaded roads and across fields, part of the time under artillery fire of heavy caliber, has reached the gravel pit south of village D. The men dig themselves in here, late in the afternoon. The battalion commander proceeds with the commanders of the 1st and 2nd companies and the commander of the machine-gun company on ahead for reconnaissance at 8:00 PM and reports at the regimental command post in village D. The regiment as yet knows no details of the crossing. Engineers have not arrived. All the artillery is still far to the rear in march column. It cannot be expected before midnight.

Enemy artillery fire is being laid down on village D. and heavy caliber fire farther to the rear over the terrain that is to be used for the advance.

The battalion is assigned to the area west of Hill 165 for an assembly area.

The battalion commander together with the company commanders looks this area over and sends orders by means of a messenger to the senior platoon leader, Lieutenant F., to bring the battalion up to the area. He wants to learn for himself by daylight what the possibilities are for crossing, and goes on with his officers over Hill 165 to the 3rd company. The hill is under mortar and heavy machine-gun fire, and he does not reach the 3rd company until dark.

According to the report of the commander of the 3rd company, and from what he has learned himself, the fact is clear that there is a strong field position on the other side of the river, beginning on the river bank. Surprise is no longer possible on account of the engagement by the 3rd company. None of the company commanders is able to get an accurate idea of the crossing site. The artillery fire on Hill 165 increases in intensity.

Keeping widely separated from one another the officers recross Hill 165 in order to give instructions to the battalion which was to have been brought up. When they get back, the battalion is not there. As it later develops, the messenger has been killed in village D. by artillery fire. Lieutenant F., who has also been looking for the battalion commander, has been unable to find the regimental command post which in the meantime has changed position.

At about 11:00 PM, the battalion is brought up through village D. which is under artillery fire. It is recognized and then digs itself in on the west slope of Hill 165. There is neither food nor coffee. Back of them everything is blocked, and the men who are bringing the food have not been able to find the battalion.

On 11 July at 1:00 AM orders are given to the regiment: the situation is considered favorable. Aviators claim to have observed that part of the enemy's artillery has withdrawn. The men themselves consider the situation unfavorable but, as always, are glad of good reports.

At 4:20 AM, a Stuka dive bomber attack is to be made on the field positions opposite the 1st battalion. Beginning at 4:30 AM—artillery fire for adjustment. At 5:00 AM—start of the attack.

Up to 2:00 AM, neither the artillery nor the engineers have arrived.

On his way back through village D. at night, the battalion commander accidentally runs into a few engineers with four pneumatic boats, who have become lost in the artillery fire. He takes them under his orders and instructs them to follow him.

The plan of combat is discussed with the commanders of the 1st and 2nd companies and the commander of the machine-gun company.

The enemy has adjusted his fire well on the 3rd company. They are unable to make any move in daylight. They will follow later as reserves. The heavy machine-gun platoon which is with them watches over and protects the advance of the 1st and 2nd companies.

The lack of pneumatic rafts is a decisive factor. Therefore, the 2nd company is to attack as the first wave. Immediately back of it, the main body of the machine-gun company. The 1st company forms the second wave. The 3rd company will follow at the order of the battalion.

It is 3:00 AM. In spite of this, not much can be discussed. The advanced artillery observers, the infantry gun platoon commander, and the promised engineers are still absent. The Stuka attack at 4:20 AM on targets immediately along the shore, which the rifle company had expected, is not made.

At 4:35 AM an advanced artillery observer arrives. Likewise the commander of the infantry-gun platoon. Both are still busy with the adjustment fire clear up until 5:00 AM.

At 5:00 it is completely light. The 2nd company is ready for the attack. The engineers have pumped up the pneumatic rafts and are ready to make the dash to the river. At this moment, eight other pneumatic rafts reach the battalion. They are not yet inflated.

The preparatory fire of their own artillery begins. They see the 3rd battalion on the right beginning the attack. This must be taken advantage of. Should the battalion commander wait for the eight pneumatic rafts?

He gives the commander of the 2nd company the order to attack, and shakes his hand. At double-quick, the company with the officers in the lead crosses the rise which is some 450 yards across and completely in view of the enemy. In long dashes the men reach the bank of the river. The 1st platoon immediately succeeds with few casualties in reaching the far side with the help of the four pneumatic rafts. They immediately get into hand-to-hand fighting here. The platoon leader does not let his forces become broken up, however, but charges straight ahead with the men who are about him. Those portions of the company that have no room in the pneumatic rafts are firing their machine guns and carbines from unfavorable positions at everyone who shows himself on the far side of the river. One heavy machine-gun platoon is able to find a position alongside the infantry gun observation post and supports the attacking portions by firing over their heads.

The battalion commander follows directly back of the 2nd company with a few messengers.

At this moment the enemy barrage begins. It is being laid down in two stretches on the west and on the east slopes of Hill 165. The observation post of the infantry cannon is put out of action. The heavy machine-gun platoon and the 3rd company are forced to seek shelter. The battalion headquarters reach the river with casualties. There is no time to be lost now. The order for the attack to the 1st company is simple: "First company on their way!"

On the far side of the river, the greater part of the 2nd company gets into hand-to-hand fighting. The attacking points are under cannon fire from straight ahead and heavy machine-gun fire from the left front. The commander of the machine-gun company sets a heavy machine-gun platoon to the job of providing protection against the left front. The same thing is done immediately with the available trench mortar men. During a lull in the barrage, the 3rd machine-gun company dashes forward across the river and is employed by the company commander with the leading portions of the 2nd company against the enemy in the edge of the woods.

The 1st company has encountered relatively slight resistance, particularly on account of the fact that it had been able to cross the river on 8 rafts over a greater width of front. It does not attempt to help the 2nd company on the left in the open field, but pushes on straight ahead.

The 3rd company was originally supposed to follow be-

hind the second. It receives no order from the battalion. What decision is made by the commander of the 3rd company? Does he follow the 1st or does he help the 2nd company? Consider the main action!

The following lessons are to be learned from the engagement:

1. Through artillery fire, approach in single-file order.
2. Commander on ahead to look over the terrain. Lieutenants and sergeants must also be able to bring up a battalion.
3. When the chance for surprise has been lost it is often practical to attack before the enemy has a chance to strengthen himself.
4. The plan of attack must be clear and simple. In crossing streams try to have a front of considerable width. Order attack in waves. Give considerable distribution in depth to the machine-gun company. Reserve company a long way off at first. Bring it up to the point of the main effort when it is brought forward.
5. Do not count on the engagement developing as planned and do not have a fixed idea of what turns it will take. Advance where possible. Conduct of operations must be flexible. The commanders must not be influenced by the apparent confusion of battle.
6. The secret of crossing streams is to go forward even with weak forces.

## Communication Installations In Firing Positions

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Captain Jensen in *Artilleristische Rundschau* November 1942.]

DURING THE WHOLE WINTER we remained in the same position with our heavy field howitzer battery. In spite of the best concealment, our fire position could not remain hidden from the enemy forever. It was near a village frequently under artillery bombardment and likewise was attacked or reconnoitered by hostile planes. Because of the predominantly impassable mountain terrain, a change of position or a shifting to alternate positions was impossible. In order to avoid losses in crew and equipment, therefore, the howitzers were dug in at unusually large intervals so that, in contrast to the training publications of the howitzer division 200/5 No. 45, the three guns of the battery occupied a breadth of almost 200 meters. This position justified itself well even with respect to fire technique. In conjunction with the particularly strong dugout installations, no losses of men and only insignificant material damage resulted in the long period of activity.

The widely dispersed fire position, however, was unfavorable for alarms (barrage by night!), transmission of orders, and dissemination of generally useful information and instructions. But in this connection also a remedy was soon found in the setting up of a bunker communication installation which functioned splendidly during the winter and rendered good service in providing entertainment for the personnel.

With the help of the local headquarters in a neighboring city, a loudspeaker unit was first procured from the surrounding territory for each of the dugouts occupied by 2 to 4 men. These loudspeakers were available in large numbers and had been the property of the inhabitants from whom they were taken to prevent listening to Bolshevik radio stations. The plan, which aroused great interest on all sides, could now be put into action.

The center of the installation was the "T" receiver in the command dugout. Into one of the two sockets for "receiver" a loudspeaker for the command dugout was plugged. In the other a double wire of captured field cable (twisted) was plugged in with an ordinary plug. This cable was laid throughout the position and spliced with a double lead for each of the individual dugouts. These secondary wires ended at the loudspeakers set up in the dugouts. Thus in all dugouts loudspeakers were connected with the "T" receiver. The enthusiasm of the gunners knew no bounds. For now a unique "dull times killer" was at hand for successfully combating the melancholy winter months by means of the transmission of news, talks, and musical programs. It should be mentioned that only a slightly greater use of anodes [tubes?] resulted from the greater load.

The communication installation was set up as follows: A field telephone, model 33, was attached to the two loudspeaker terminals in the command dugout with double wire. To achieve the voltage necessary for all the magnets of the loudspeaker units, four field elements with a total of five to six volts were used. The portable field telephone bore this increased load without difficulty. It was possible to speak into the telephone and be easily understood in all the dugouts. A separate connection of the field telephone with the outer circuit of the dugouts was not necessary, since the connection between the field telephone and the outer circuit was furnished within the "T" receiver by the "receiver" sockets. Thus in practice the field telephone could be plugged in on any loudspeaker of the network.

It was possible even to talk with each individual dugout. The person addressed through the communication system spoke into his loudspeaker and was clearly heard in the earphones of the portable field telephone in the command post. In the loudspeaker, to be sure, these answers could not be heard because of the low voltage.

Taking advantage of this possibility, loudspeaker connections were also laid to the posts of the gun commanders, so that in case of necessity the battery commander could talk directly from the command dugout to the firing guns without platoon leaders and other intermediate callers, and the reports of the execution of his orders were announced to him in the same way.

The described installation was set up in a short time by the men of the communications detachment who went at the work with great enthusiasm. It enjoyed universal and complete approval. Soon our fire position was the topic of conversation in the whole sector, and it cheered our spirits no little when we even produced our own entertainment program on our "Voice of the Dugout" with the help of "battery talent" during quiet periods.

## External Bearing and the Spirit of the Troops

[An article by Lieutenant Colonel D. Perret in *Revue Militaire Suisse* September 1942. Translated in the Intelligence Branch, Corps of Engineers, War Department, Washington, D. C.]

THE OPINION is current among our soldiers and in the public that the external bearing of the officers and the troops has no relation to the warlike spirit and that it is not necessary to have an exemplary bearing in order to do one's duty.

More and more numerous are the soldiers of poor bearing, sauntering around our large cities with their hands in their pockets, with the eternal cigarette or sometimes the democratic butt between their lips (as if this were an absolutely indispensable element of the uniform), and not saluting officers except when they really cannot avoid it.

Many old soldiers have the unfortunate belief that it is good style to sink into the negligent bearing, and when by way of exception someone calls their attention to it, they hide behind the pretended privilege that "they are no longer rookies." It is superfluous to remark how poorly fitted are all those who frequently have nothing military about them but their uniform, such as the many "auxiliaries" wearing oxfords, badly shaven, or scarcely knowing how to salute, to raise the prestige of the army in the eyes of the foreigners who are observing us and judging us by those whom we would rather hope to be taken as exceptions.

If, at times, an officer intervenes on the street to remind a soldier of his duty, he may be almost certain that his attitude will be approved only by a minority of the civilians present. The latter, even though they may have been soldiers in their own time, will most often take the part of the delinquent and will consider the intervention of the officer as quibbling with this "poor draftee" who, in their eyes, has every excuse, including that of not having seen in time the officer whom he should have saluted. Personally, it has been my frequent experience that if an officer who notes a behavior flaw takes the trouble to act against it by drawing the misfeasor aside (even at the risk of not being approved by the gallery), he will be understood by the misfeasor. There is, of course, a proper way of making the observation and I am persuaded that if all officers dared to do their duty in this domain, the cases of poor behavior would rapidly diminish.

It is proper to acknowledge that officers themselves are not all above reproach. I have been obliged to remind two officers, obviously deeply absorbed in a violent discussion, that it was nevertheless their duty to be attentive in order to return the salute of a young recruit who had passed, and I have been obliged to explain to another officer that if it is our desire to insist on good bearing in our soldiers, we must set the example by wearing our coats buttoned and placing our gloves as the regulations require.

A squad the individual members of which do not behave correctly in their hours of leave has not been fully educated; it brings no honor to its leaders and the latter have not known how to make the best of the time available. I hear some comrades answer: "With all the men whom I am obliged continually to grant leave, it is impossible for me to continue the education in a rational way," etc., or, as a battalion commandant told me: "It isn't always easy to maintain, for many months, the interest of the men in their work." These are bad excuses. Those who think and talk in this way have learned nothing of military education. It is perhaps from this that our present army suffers most.

Individual soldiers who neglect their clothing or avoid saluting are also almost always bad soldiers in their units and may not be depended on in war or simply in a case of real danger. These men certainly have a poor spirit, they have little self-assurance and ought to be given double surveillance and education by their superiors. They do not deserve the trust of their superiors that is expressed by permission to go out alone. Some perhaps have good spirit, at least they brag of it, but they think it superfluous to make the disciplinary effort which the accomplishment of their duties as soldiers demands; they too have not been fully educated.

The company leader should speak more often to his men, all of them together and to certain ones privately, about their service duties when they are alone, whether discharged or on leave, and should make them feel the importance of this bearing of the individual. The company leader must also determine for himself that what he has ordered has been in fact carried out; he must himself make the necessary check. If he delegates this to his lieutenants—for example, leaving the principal roll call to one of them because he has more important things to do at the moment—he shows that he

has not comprehended his own role and he should no longer be surprised if his men do not take their duties more seriously.

If the battalion or regiment commandant does not apply himself to this frequent check on the education of his units, demonstrating by his presence all the importance he attaches to it, he can assume on his own account a portion of the responsibility for cases of bad behavior in his men.

In fact, it is no exaggeration to say that for the majority of cases of misbehavior or indifference toward the concept of service duties *it is the leaders who are directly responsible*, most of the time because of their inactivity.

It is therefore *especially* in this direction, the education of the troops, that watch must be kept. Neither perfected arms, nor the most powerful fortifications, nor the best matériel, nor the extension of the period of service will help to maintain our independence if the spirit and the morale of the troops are not of the same quality.

## Mining the Gulf of Finland

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Die Wehrmacht* 11 November 1942.]

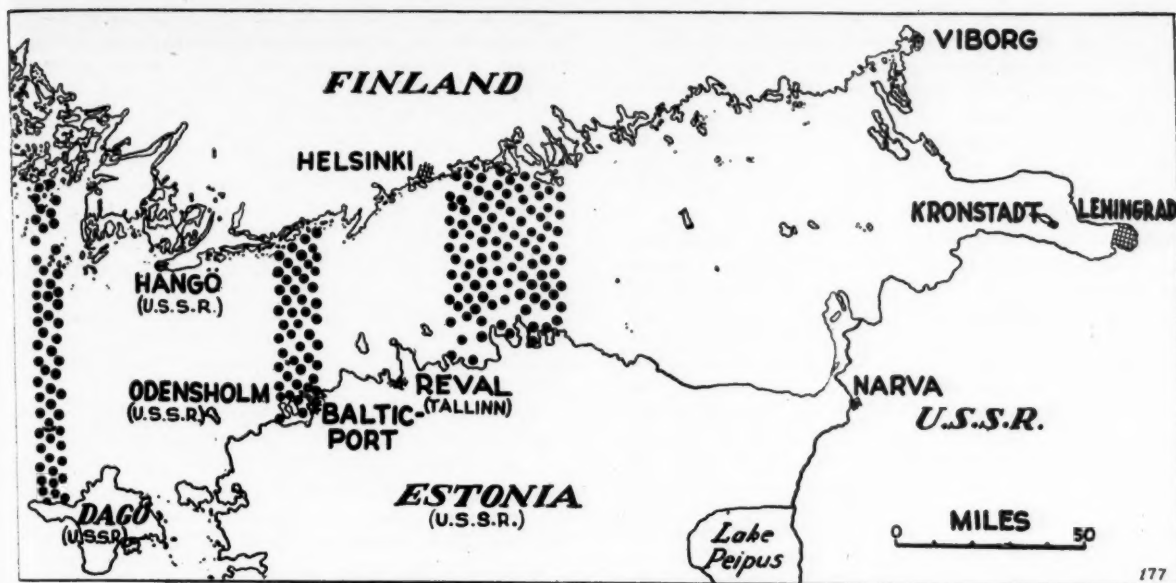
WHEN THE WAR BEGAN against the Soviet Union the German navy was faced with the fact that the Russians in the Baltic had at their disposal a superior force of war vessels consisting of battleships, cruisers, destroyers, torpedo boats, submarines, speed boats, etc., and as a result of their war with Finland in 1939-1940 and the annexation of the Baltic states they had come into possession of a string of important naval bases on the eastern and central shore of the Baltic as, for example, the Latvian ports of Libau and Riga, and the Estonian ports of Reval and Baltic-Port. At the time of the annexation up to the beginning of the war on the eastern front, the islands of Odensholm, Dagö, and Ösel (south of Dagö) situated off the coast of the former Baltic states had been strongly armed with artillery and fortified. The first day of the war found the main part of the Soviet forces in Kronstadt, Reval, Baltic-Port, and Hangö (see map).

At all costs the Soviets had to be kept from controlling the western Baltic and interfering with the traffic between Germany and Scandinavia, and from landing troops on the German Baltic coast. Since the German navy, which was much weaker than that of Russia, was not able to fulfill this task, the enemy's naval forces had to be bottled up as far as possible by means of mine barricades and prevented from getting out. This was accomplished in several boldly planned and executed operations which can be mentioned here only in very general terms.

A look at the map suffices to show where the various groups of German mine layers operated. The first group had the task of laying down a mine barrier in the western end of the Gulf of Finland for the purpose of closing it. The second group was to operate to the east. The execution of these tasks was by no means easy, for the activities of the mine layers naturally had to be unknown to the Soviets. It was necessary, therefore, first of all, to work in the darkness of the night, and secondly, as much as possible without the employment of weapons. The ships were camouflaged by paint in such a way as to cause them to blend with nocturnal light conditions. As a matter of fact Soviet war vessels came into sight during these night operations but as a result of the camouflage they remained ignorant of the nature of the German boats.

As may be supposed, the Soviets attempted, when the first of their ships had encountered the mine barrier, to drive





GERMAN MINEFIELDS IN THE GULF OF FINLAND.

the mine layers out of the Gulf of Finland. The German ships thereupon hurried to the rocky coast and with the help of fir and birch trees and heather they decorated themselves till they resembled harmless islands.

The next great task was to lay a barrier between Finland (Helsinki) and the Soviet-Estonian coast. This operation was made particularly difficult by the fact that there were strong Soviet forces situated in Reval. Then also there were enemy mine fields, part but not all of which were known.

In order that the mines might sink as uniformly as possible, the rate at which they were dropped was controlled by a stop watch. One of the mine layers dropped 5,000 mines in these operations. What this figure signifies can be understood by the fact that during the World War the British blockaded the English Channel with some 30,000 mines and the North Sea between Norway and the Shetland Islands with some 57,000 mines. Altogether in the last war 120,000 mines were sunk in European waters and this in the course of four and a half years, while in the Gulf of Finland operations lasted but a very short time.

Immediately after the first mines had been laid, reports began arriving in a steady stream of boats running into them. The crowning of the work was delayed, however, until the end of August when Reval was in danger of falling into German hands. In the port and roadstead of Reval lay numerous Soviet battleships, cruisers, torpedo boats, submarines, and twenty destroyers for which, at the end of August, it was high time that they should return to the safer port of Kronstadt. This took place on 27 August, and on this day the thought and care with which the German barriers had been laid were rewarded in a great way. The Russians ran into the barriers and destruction of ships began such as had never been witnessed before in any waters on earth. On this 27 August alone 50,000 tons were sunk by mines and 70,000 tons damaged and the latter then fell victim to the air forces. A few of the ships escaped to Kronstadt, among them the cruiser *Kirov* which was able to reach the Soviet fortress in a badly crippled condition. Altogether the Soviets lost by mines alone in this barricaded zone 130,000 tons of shipping, about half of their Baltic war and merchant fleets.

Let us mention one other remarkable exploit. As may be imagined the Soviets went to all possible pains to reestablish the line of communications between Kronstadt and Hangö

by means of powerful naval formations as long as Hangö was still in their hands. A formation of eight warships attempted to break through the barriers. On the way out four of these ships were lost and three more went down on the way back so that only a single ship again reached Kronstadt.

## Communication Problems in Tunisia

[Extracts from an article in *The Times* (London) 15 January 1943.]

IN THE past few days I have traveled by road to Algiers and back, a total distance of a thousand miles.

The roads here, like everything else from the cars to the plumbing, have been neglected since June 1940. The First Army arrived to find that troops and supplies must be carried forward a distance of 500 miles over an inadequate road system badly maintained. Choked ditches had to be cleared, for nothing undermines roads like faulty drainage. Bridges never designed for huge modern military vehicles had to be repaired or strengthened. Scores of miles of road surface had to be relaid. Bomb or shell craters had to be filled up. Much widening had to be done, for the roads were seldom big enough to take more than two lines of traffic, and not always that. Bridges were almost always single-line traffic width, and therefore many duplicate bridges and approaches had to be built. Elsewhere fords were constructed. In our November advance bridges blown up by the enemy had to be repaired.

All sorts of subsidiary problems arose. Quarries had to be opened or reopened to supply the high quantities of stone needed. Extra labor had to be found, and the use of Arab labor provided fresh headaches. Money wages were of little use to the Arabs, who had nothing to spend them on. What they needed was clothes, and cloth is almost unobtainable in this country. So arrangements are now being made to provide Arab road laborers with dyed suits of battle-dress. It has been necessary to find tents or other shelter for them, as well as for French and British workers. The French Department of Bridges and Roads has given us all the help it could, but the main burden of all this has fallen on the sappers.

The sappers also have to maintain the aerodromes and construct new ones; everybody now knows how the lack of

aerodromes close behind the front has complicated the provision of close air support. The chief trouble is the unsuitability of the prevailing soil, which swells when wet and cracks as it dries. But the sappers are overcoming the difficulty, and the provision of new airfields is now really under way, though it is useless to expect instantaneous results. Another standing job of the sappers is discovering and rendering harmless mines and booby traps which the enemy is using freely in certain sectors.

Now that danger is over there is no harm in saying that some weeks ago some of our troops in Tunisian forward areas were down to their last day's supply of rations and nearly as low in ammunition. The result of our extremely and unexpectedly rapid advance in the early stages was that, as a staff officer put it to me, "G. was there three weeks ahead of Q," meaning that operations had outrun supply. It was considered policy to take that risk in the hope of taking Tunis in one rush, and history will show how nearly the rush succeeded. But it did not succeed and the troops were left out in the front with the supply services laboring to catch up with them. At regular intervals all the way from here to Algiers, even in country so desolate that it reminded me of the Chilean nitrate desert, there are traffic control points and petrol dumps, with notices at every point to tell drivers how far ahead the next one is. There are military police all along the route, and they have marked with notices every dangerous hill or bend for 500 miles—and there are plenty.

But when all is said and done, the quick and regular provision of supplies depends not only on keeping the roads fit and assisting traffic on its way, but on the men who drive the vehicles; and the drivers are the unsung heroes of this campaign. In the early days of the campaign one convoy of 300 vehicles 15 miles long moved 380 miles in 29 hours. In the forward areas they have often had to move through the night without lights.

The Signals found the national system of communications in a state of utter neglect and the telephone system in any case inadequate. In effect they have put a new national telephone service into North Africa. Their line sections have had to test every bit of the existing installations. For instance, they have had to replace many hundreds of cracked insulators which were letting in the rain and causing faults. They have set up over 400 miles of overhead wires and uncounted hundreds of miles of ground lines. The local French telephone and telegraph service has given whole-hearted and invaluable help, but no maintenance has been done for nearly three years and the job is enormous. In early stages staff officers had to spend half their nights on motor-bicycles riding through possibly hostile country to find out what was happening in different parts of their sectors. Thanks to the indefatigable work of the Signals those nights are becoming rarer.

## Clearing Minefields at El Alamein

[From *The Tank* (Great Britain) April 1943.]

Sergeant Millard, of the Royal Engineers, now in England, and whose home is at Aldershot, tells the story of how his unit played its part in clearing a path through the minefields at El Alamein.

This was the crucial initial task without which the armor could not have driven through in overwhelming force to the main enemy positions.

He describes first the task which confronted the Royal Engineers, and secondly the way in which it was performed.

"We were confronted with four strips of minefields, each about 500 yards deep, and separated by intervening areas of 'no man's land,' running along the whole front from the Qattara depression to the coast.

"On the 23rd October, at 9:40 in the evening, when the barrage was due to begin, these minefields were a dark, uncharted wilderness, dotted with enemy posts whose positions our aircraft had previously reconnoitered. Our task was to produce by first light a series of lanes 40 yards wide completely clear of mines, duly taped, marked and lighted, right through the four minefields to the main enemy positions. The general line of the gaps or lanes had been determined by previous reconnaissance, but the job itself had to be completed without fault in a single night.

"In order to be ready for this great undertaking we had spent several weeks training about 20 miles east of Alamein in similar conditions. Here we developed a precise drill of mine-detecting and gapmaking in which every man had his particular job and know it thoroughly. We practiced with genuine minefields.

"First the tape men crawled forward to define the lane with tapes, then came men with detectors who located the position of the sunken mines. Other men clearly marked these positions, and then came the men who actually handled the mines, removing the detonators and placing the now harmless mines outside the line of the tapes.

"Our method was first to lay a single tape from the starting point along a compass bearing in the desired direction. Then with this tape as center line, to lay two other tapes parallel at eight yards distance from the center tape, making a lane 16 yards wide. When this lane had been cleared, we would extend again eight yards on each side, thus widening to 32 yards, and finally to 40 yards.

"On the great night itself, the intense barrage lifted just after 10 o'clock and the infantry dashed forward to overcome all enemy posts which covered the minefields with machine guns and small arms fire. The arrangement was for them to fire Verey lights when this had been accomplished.

"So successful were the infantry on my sector (they were Maoris) that the lights went up ten minutes later, and we went straight to our starting point in the minefield, where I acted as sergeant in charge of the gap, armed with a Tommy gun. It was my business to see that each man followed the exact drill—tapes—detectors—markers—minelifters, and to supervise the general layout of the work.

"We started straight away with the tapes, and everything went like clockwork except that one undetected machine gun was still firing at us from left front. I spoke about this to a Maori Regimental Sergeant Major, and he at once agreed to look to it. With only three men he went out and silenced the post with grenades. He himself came back on a stretcher with arm wounds, but he said to me as he passed 'don't worry, they won't live to tell the tale.' Other Maoris passed us with a few prisoners, and plenty of souvenirs in the shape of radio sets and necklaces of ammunition.

"By about midnight we had cleared our way through the first minefield and our 40-yard-wide lane was duly marked by the provost section with pickets lighted by colored lamps facing east, invisible to the enemy.

"At this stage it was our practice to try out the lane by means of driving a 'suicide car' along it to make sure that no mines were left. We used an old vehicle well stuffed with sandbags. I drove this car along the right side of the lane as far as no-man's land and intended to drive back along the other side of the lane. But I was unlucky in striking an unsuspected mine in no-man's land itself as I was making the turn, and was rather badly shaken.

"However, I was at work again half an hour later, and by 4:30, before dawn, we had cleared a complete lane through all four minefields, wider and better lighted than Piccadilly itself.

"Mine was of course only one lane, and others of similar type were made at other parts of the front. Signals were

also busy all the time, and by morning they had established all their communications to the forward edge of the mine-fields.

"In the morning our armor and supplies went thundering along our well-defined gap into the battle, completely surprising the enemy. The traffic continued three deep for days.

"For the ten days of the battle our main tasks were those of maintaining the gaps, and of preparing cleared sites for gun positions as the guns went forward through the mine-fields. New sites had of course to be made as the battle shifted forward.

"When the pursuit started, our principal task was the clearing of the sides of the road of mines and booby traps. Other engineers went forward with our armor to clear the road itself where necessary, and to attend to 'tank-busting.'

"'Tank-busting' means going out with our forces and 'finishing off' all slightly damaged enemy tanks, so that if the scene of battle changes they will be irrecoverable. This is done in rough and ready style by exploding charges in the machinery and gun breeches.

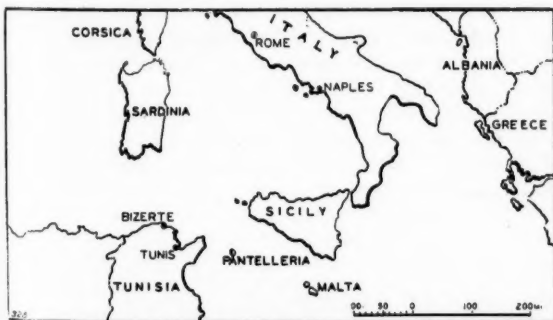
"The complete clearing of the route and adjacent buildings can be done at the rate of six miles a day, but of course the spearhead does not wait for that."

## Pantelleria— The Italian Malta

[Translated in the War Department, Washington, D. C., from an article in *Militär-Wochenblatt* 17 July 1942.]

*Although the "invincible citadel" of Pantelleria is now in our hands, it is of interest to read this account from a German military magazine of a year ago when it seemed that "proud Albion must reconcile herself with gnashing teeth" to the apparent invulnerability of this dangerous little Italian island.—THE EDITOR.*

AT THE MIDPOINT of the axis of the Mediterranean Sea there lies in the Straits of Sicily the small island of Pantelleria, the ancient Cossyra, the earlier history of which is very little known. To the Italians themselves, the island was known as an unlucky place of banishment for traitors, and only someone obliged to make an intermediate stop on the



trip from Sicily to Tunis in an extraordinarily slow steamer learned to recognize Pantelleria with his own eyes. Only in 1936 when the English press in large headlines brought out the sensational report "Pantelleria—a New Italian Base!" did the previously uninteresting and unnoticed island find itself in the way of world politics.

The largest of the three islands making up the Pantelleria group has an area of thirty-two square miles and 9,050 inhabitants (1921), 6,870 of whom live in the capital city of the same name; they speak a Sicilian dialect extensively adulterated with Arabic and Latin words.

It is a typical volcanic island rising to a height of 2,700 feet with extinct craters and sulphurous hot springs; a few sulphur mines are in existence. In the fertile earth grow grapes (muscatel), olives, figs, pears, capers, flax, and wheat in abundant plenty, although the island is waterless and drinking water must be brought in from the mainland; consequently, there is no grass and thus, because of the lack of cattle, there is no locally-produced milk and butter. Exports of wine, tropical fruits, olive oil, and capers are quite large.

From the founding of the Italian Empire, the center of gravity of Italian policy shifted southward, especially toward the island of Sicily which became the core of the Italian defense system. With Mussolini a new epoch began for the purpose of making a reality the slogan "mare nostrum," that is, to break the hegemony of the western powers in the Mediterranean, the indispensable living space of the new empire. It was in this direction also that the decision of the Duce, announced in 1936, of transforming Pantelleria into a first-rate fleet and aerial base, was aimed.

Approximately equidistant from Gibraltar and Port Said, Pantelleria divides the Mediterranean Sea into eastern and western basins. Its situation in the middle of the Straits of Sicily makes this island a barrier which can hermetically seal the Mediterranean and interrupt traffic between the two basins. It is true that Pantelleria does not lie precisely at the half-way point in the straits, for the distance to Tunis is about 40 miles and to Sicily 60 miles, but these space dimensions, especially slight to the aerial arm, enable Italy to control effectively the main route of navigation of the Mediterranean from this island in both directions and to fix the law of trade for the decisive military operations in the central Mediterranean. Here at this narrow channel the Mediterranean problem is concentrated to its fullest. The geopolitical and strategic situation of Pantelleria is far more favorable than that of Malta, since the route from Sicily to Libya by way of Malta is three times as long as by way of Pantelleria, and thus the area to be supervised becomes much greater and much more difficult to watch.

In 1936, immediately after the close of the Ethiopian War, a start was made with increased force on the development of the island into a base for small ship units and especially for airplanes. The steep and broken coasts with their numerous jutting cliffs form a natural fortified belt and offer the Italian submarines welcome shelter, secure against enemy surprise landings. The single shallow bay has been made available also to larger warships by dredging. The bottom requirements for the planting of naval mines for obstacle purposes are here met to an outstanding extent; the built-in coastal batteries find good concealment under the protection of the rock formations and are exposed to no danger from well-aimed aerial bombs. In contrast to the narrowness of Gibraltar, there is ample space here for the necessary runways of the flying fields; galleries carved in the rock provide bombproof shelter for planes and oil tanks. It is precisely by the utilization of the natural rock formations that the island has become an invincible citadel that can be defended with relatively small combat forces. One can only wonder that Italy did not realize in earlier years the ideal strategic situation and the favorable space conditions of the island for the establishment of a point of support. In the middle of 1937 Pantelleria was declared a military zone over which all flying was forbidden, a measure which especially in England was received as an annoyance.

Against the trump of Malta, the Italians have played the trump of Pantelleria. The occupiers of Malta have lost their control over the adjoining eastern and western areas. The route of power, Gibraltar-Malta-Suez, is broken in the middle. Proud Albion must reconcile herself, with gnashing teeth, to this distributing fact.



## Russian Defensive Methods

[From *An Cosantóir*, Dublin, April 1943.]

DEFENSES consisting of a line of deep trenches extending for hundreds of miles from the North Sea to the Swiss frontier characterized the war of 1914/18 on the Western Front. In other theaters, too, the same system prevailed. According to Col. Shiskin of the Red Army, the principal peculiarity of the defensive of the present day is its depth. The change in tactics as compared with World War I is due to the wholesale mechanization of the armies, enabling them to employ tanks in echeloned formation and to introduce large bodies of motorized infantry. The increase in fire power of the attackers due to the mobility and diversity of the weapons with which they are possessed and their much more rapid action are other powerful causes for the change.

Experience has taught the Red Army that no matter what the magnitude of the defenders' resources may be they will be insufficient to build a deep, strong, staple line along the whole mighty front in Russia. Aircraft and tanks can always hunt out the weak spots and seek for badly connected sectors in the defenses. The attacker's mobile equipment makes it possible for him to concentrate rapidly with sufficient forces to take advantage of any weakness to plunge deeply into the heart and through the rear of the defensive system. Here then was a problem of the first magnitude urgently requiring a solution.

It is not clear whether the Russians themselves hit on the idea that gave them what they considered an answer to their difficulty or whether the Germans obliged by giving a clue. Be that as it may, they conceived the idea of a defensive system based on the elements of the defended area which they now speak of as "strongholds."

Colonel Shiskin admits that during their attacks against the Germans in the winter of 1941/42 the Red Army observed the means adopted by the former of countering an offensive so well armed, so mobile, and so concentrated.

The severity of the Russian winter of 1941/42, which by all accounts outclassed previous winters for many years for conditions of cold, frost, ice, and snow, drove the Germans, who were ill-prepared for these Arctic circumstances, into inhabited areas. They set about defending themselves in the towns and villages forming pockets of resistance. They adapted and fortified the dwelling houses. They deepened the cellars, loopholed the walls, emplaced their guns in the stone foundations and fired through the embrasures in the walls. Constrained as they were, to seek shelter from the elements, by occupying towns and villages whose tactical situation was not often the best, and the relation with neighboring defended strongholds not too well defined, they left considerable gaps between their pockets of resistance making observation difficult and fire cooperation impossible. The Germans had to supply the links in the chain of defended localities by patrols of mobile groups often reinforced by tanks along the roads.

As the system was evolved to meet modern methods of offense, where large masses of tanks, aircraft, and mobile infantry have given the war on the Soviet front an exceptionally mobile character, deep defenses are created where a blow is expected to fall. Objects of strategical and important practical significance receive prior consideration in the lay out of the system, which is composed of strongholds and centers of resistance.

Many advantages are claimed for the system. The principal virtue it possesses is that it permits the effective employment of fire power with the expenditure of the minimum of man power. It can be maintained for a long time even when the attacker has driven a spearhead deep into the defenses or has accomplished a flanking movement.

It breaks up or distributes the efforts of the attackers. The deeper the attacking wedge enters into the defenses the greater the forces the attacker has to allot for the reduction or containing of individual strongholds and for the protection of his flank and rear.

The attacking forces are, therefore, tied up with the separate elements of the defense system and are split up amongst a number of points, some of which may not even be connected with one another. This process dissipates them to a number of small points and leaves insufficient strength to capture the whole defensive scheme or attain the main objective.

Strongholds are mainly constructed for the defense of tactically important points such as villages or cross-roads. The stronghold consists of a number of machine-gun nests and artillery emplacements screened by earthen bunkers. Firing positions are connected by a system of tunnels, trenches, or other defensive means. The distance between fire positions is not less than the minimum effective range of a machine gun.

The fire system of each stronghold is so arranged that all avenues of approach are covered by interlacing layers of fire, and in addition each firing point is covered by enfilade or flanking fire from its neighbor.

All the approaches are also protected by anti-personnel and anti-tank obstacles, which presumably include a large percentage of mines and tanktraps which the Red Army Engineers are particularly skilful in camouflaging and laying. The size of the garrison depends on the nature and importance of the object they are protecting, and ranges from a platoon to a rifle company, supported by mortars and guns.

Sometimes when the task demands it, and the situation is favorable, the strongholds are reinforced by a few tanks. It is also a practice to emplace damaged tanks as stationary fire points or small forts.

Gaps between the fire points are closed by short trenches with light cover and manned by a section of light automatics and tommyguns.

The "Center of Resistance" is made up of a complex of such strongholds arranged in definite tactical relation and fire communication with each other at a distance not exceeding the effective range of infantry weapons. These centers of resistance cover the most important directions. They are carefully prepared and deeply echeloned to the rear or to a flank. They are tactically independent.

The garrison of a Center of Resistance numbers up to a battalion and sometimes even a regiment strengthened with whatever weapons or specialist personnel are required to make them completely self-contained.

This system of defense has been found eminently suitable to the Russian terrain, where roads are few, where there are large areas of swamp and woods and where a deep layer of snow covers the ground in winter.

## The Role of Air Power In the British War Effort

[An article by Air Chief Marshal Sir Robert Brooke-Popham in the *Journal of the Royal United Service Institution* (Great Britain) February 1943.]

IN THE LAST ISSUE of the *Journal* there appeared an interesting article entitled "The British War Effort," by Admiral Sir R. P. Ernle-Erle-Drax. With many of his statements there will be no disagreement; but the first part of the paper gives the general impression that behind the views expressed lies the influence of the one-Service mind and that this leads the writer into inconsistencies and blinds him to the full

potentialities of aircraft and in particular their flexibility and ubiquity. He seems unwilling to acknowledge the existence of air power, at any rate he never mentions the word, and he tends to regard the Air Force merely as the handmaid to the Army and Navy. For instance, we are told, "in order to win the war we must win battles on land and sea." True, but most people are of the opinion that the Battle of Britain, fought in the air in the autumn of 1940, made no small contribution to the ultimate defeat of Hitler. We shall not win this war within reasonable time unless every form of activity is used, not only to the full but in its most effective manner, and the whole coordinated in one combined plan. This paper is written not merely to criticize Admiral Drax's article but because the present writer is convinced that some of the views expressed in it would, if accepted, militate against the most effective use of air power and thus lead to unnecessary lengthening of the war.

The Air Force has been unfortunate in that it has imported new meanings into old terms and those new meanings have not yet been widely realized. This especially applies to the word "independent" which still seems to lead people to believe, or at any rate to argue, that the Air Force intends to operate on its own without any reference to what the Army or Navy are doing or even to what the Government policy is. That is not the case: the operations of the Bomber Command, for instance, are governed by the policy of the War Cabinet; they are not a kind of special preserve of the Air Ministry bearing no relation to other war activities. Nearly half the total effort of the Bomber Command over the past twelve months has been devoted to naval targets, such as enemy ports or works producing U-boat engines. Only a small fraction of its total effort has been devoted to what we may term purely airpower objectives, such as aircraft factories. In general the targets selected are closely related to our own operations and to those of our Allies. For instance, the attack on the Schneider Works at Le Creusot and on the Renault Works in Paris certainly reduced the number of German tanks on the Russian front by scores and the number of lorries by many hundreds, while the attacks on Lubeck and Rostock destroyed thousands of tons of stores intended for the German armies on the Eastern Front.

Many cities in Britain bear witness to the destruction that may be wrought by air attack and, though some may not go so far as to agree with the statement that "ships today move by the leave or under the protection of the force that controls the skies above them," no one who has read of the events in the South-West Pacific can any longer doubt that aircraft attacks are sufficiently effective fully to justify the use of the term "air power." However distasteful and troublesome it may be, a third power has arrived on the scene and must be treated on the same plane as sea power and land power. We must think of a trinity of power—sea, land, and air—completely coordinated and wielded in the manner laid down by the War Cabinet, or, if preferred, of three great gear-wheels closely intermeshed and revolving together in harmony. Acknowledgement of the existence of air power in no way militates against the concentration of air effort in assisting the Army or the Navy, should the War Cabinet decide that the situation demands it. The German Air Force is a unified service under its own commander but that did not prevent the bulk of the German air effort being devoted in 1940 to the direct assistance of the Army, because the German High Command had decided that the way to win the campaign in France was primarily through land power, as represented by their greatly superior mechanized forces. What some people refuse to recognize is that when the maximum degree of assistance either to the Army or to the Navy is required, it can be obtained far more easily by centralized control than by a permanent allotment of the same number of aircraft to specific duties.

Any attempt to divide up air power between sea power and

land power indicates failure to realize the ubiquity of the air; for the air is all one and we cannot isolate air warfare into rigid compartments relating solely to the sea, or to the land, and the control of sea communications must not be regarded as a problem of sea power alone. The control of sea communications is exercised by surface ships and aircraft together, and we must think of sea power and air power as working in combination. Otherwise we shall limit the extent to which all the available resources of our air power can when required be used to support our sea power. Take the situation in England today. Owing to the favorable air situation around the coasts of Great Britain coastal shipping is enabled to move and use ports with comparatively little interference. But this situation is not brought about solely by aircraft operating over the convoys; it is brought about partly by interceptor and night-fighter aircraft operating from land aerodromes over Britain, and still more by our offensive air operations, both air fighting and air bombardment, against the enemy's air bases, communications, and military and industrial establishments on the Continent.

Those who claim that all air operations are but an extension of sea power or land power would make the classification depend upon the question whether the target attacked is on the sea or on the land. But flying boats have, in one flight, bombed military barracks, road convoys, and ships. Spitfires, within an hour, have attacked locomotives and sea-going tugs and other small craft. The air attacks on Genoa were in support of land operations, but were directed mainly against shipping conveying supplies to Rommel's Army in North Africa. It would be difficult to place any of these operations under the heading of land power or of sea power. Is a submarine shelling a railway exercising sea power or land power? In which category should coastal guns firing at warships be placed? Should aircraft taking off from a carrier and attacking an aerodrome fifty miles inland be classified as a form of sea power or land power?

If we start arguments as to whether any particular form of air activity is exercising sea or land power, we shall only drown our ideas in a hazy medium of words, and reach no conclusion. If we regard it as the exercise of air power integrated with sea power and land power so that the three always operate in conjunction, then we get a simple and clear picture in accordance with the facts. The tendency to attempt a rigid division between air operations over the sea and air operations over the land is possibly due to the obvious distinction that has always existed between sea and land itself. This gives rise to a feeling that the same difference ought to extend to the air, which in fact knows no such distinction but flows equally over both. So long as a proper attitude of mind is adopted, air power, far from introducing a discordant note, can bind and integrate sea power and land power, for it is all pervading and all embracing.

This is not a mere academic discussion because, if carried on to its logical conclusion, the division of air power would tend to over-specialization of aircraft and their crews and to a more rigid allotment of aircraft to particular duties, with consequent loss of flexibility. That would be a mistake even if the numbers of aircraft were unlimited; but they very definitely are not. We have got to make the fullest and most effective use of every aircraft we possess. Technical development is tending to eliminate the difference in aircraft and their equipment. We must take full advantage of this and so make aircraft even more interchangeable than they are today. There is a limit to the total resources available for the manufacturer of war material and, once the decision as to the allotment between sea, land, and air has been made, any subsequent change necessitated by some unforeseen development will not become effective within a period of, perhaps, a year or more.

Now warships cannot be used on land, neither can tanks be used at sea, but aircraft can reinforce either, provided they are not over-specialized and that there is unity of direction to ensure the maximum concentration of air effort wherever most required in a minimum of time. Thus they afford a rapid means of re-adjusting a lack of balance. Re-allotment of aircraft is constantly taking place: squadrons that have been bombing Germany have been allocated to Coastal Command and within a short time have been playing their part in the protection of sea communications; Spitfires have been taken by carrier to Malta and been in action sixteen days after the decision to send them was reached—an instance of naval cooperation with the Royal Air Force; a Beaufighter squadron moved from the Middle East to India and during the night of the sixth day after it started brought down Japanese aircraft. Bomber squadrons have been flown from England to Africa and soon after bombing the Ruhr have been operating from Egypt over the Mediterranean or over Libya. The Germans adopt the same principle; after the defeat of the French armies, squadrons of Heinkel III's were used within a few days for such diverse purposes as bombing in direct support of the German Army, mine laying, and attacks of ports on the French coast.

The flexibility of the air is made evident in many other ways besides reinforcement, for instance the facility for switching from one target to another. Admittedly this may introduce the risk of failure to pursue a single object with energy and perseverance to the end, but that merely emphasizes the necessity for a staff capable by training and experience to appreciate the difficulties as well as the potentialities of directing air operations. An instance of this form of flexibility occurred in the middle of January of this year, when a large force of bombers, which had been attacking the Ruhr, were quickly switched to bomb U-boat bases on the French West coast; this, again, was immediately followed by two successive attacks on Berlin. Another instance was in June 1942 when the British Army was retiring towards El Alamein; a convoy was on its way to Malta and a large proportion of the German Ju. 88's were diverted from targets on land to attack it: and the Royal Air Force devoted its long distance fighter aircraft to protection of this convoy. Neither of these switches would have been so easy had those squadrons been allocated definitely to the Army instead of being under air control. This feature of flexibility is also made evident in the power of aircraft to attack different targets all with the same object.

Much has been written on cooperation, but in many cases ideas have not yet gone far enough. Cooperation is not merely the drawing up of a plan by one Service which then sees how the other two can assist; practically every operation must be regarded from its inception as a combined one and worked out on that basis. The Navy and the Army must be no less prepared to cooperate with the Air Force in winning air battles than the Air Force to cooperate in winning sea or land battles. If cooperation is regarded solely from the one-sided point of view, there will be an inevitable tendency to use air power as an auxiliary to enable older forms of warfare to continue instead of using it in the most effective way to bring about the result required. Whilst small escort ships may always be necessary it would, for instance, be obviously waste of effort to protect a convoy with capital ships and to

have air protection for the latter when aircraft could equally well protect the convoy directly.

A good instance of the mutual interaction between all three Services is the recent campaign in Egypt and Libya. From the narrow point of view, the Allied air forces might be considered merely as having helped the Army to advance; yet each advance of the Army meant the occupation and defense of fresh landing grounds whereby the air forces were enabled to fling their power farther afield, thereby again assisting the Army forward movement. But the influence of air power was felt not only over the land but also over the sea; it enabled the Navy to move westward in comparative safety, thus allowing ships to bring up supplies for the use of the Army and later on to reinforce Malta. Here is a classic instance of the true inter-relation of the three Services.

According to Admiral Drax "there is little value in winning battles in the air if we cannot also win them on land and sea." But if there is one lesson more than another that this war has taught us it is that we cannot win battles on land and sea without first winning the battle in the air over both land and sea. In fact we have been severely punished for refusing, before the war, to believe this simple fact and for not having sufficient air power to give effect to it. So far as this war has gone at present, it is difficult to draw deductions about battles at sea, as they have on some occasions been fought and won whilst the opposing surface ships have never been within a hundred miles of each other. If we take the intended invasion of Britain in the autumn of 1940, the attacks by the German Air Force were almost certainly directed to bringing about a favorable air situation over the coast of France, over the Channel, and over the South of England, so that the Army could have been ferried across; the defeat of these attacks stopped the invasion. Again, in the battle of El Alamein a necessary preliminary was the complete air superiority obtained in that whole area by the Allied air forces. A similar instance is Allenby's victory of September, 1918, in Palestine.

Space does not permit of a discussion on the bombing of Germany. But one point must be stressed, namely that it is by using aircraft offensively that the fullest value of their special characteristics can be obtained. Moreover, our bombing attacks on Germany have forced the enemy to lock up more than a million Germans for defense; a large proportion of these might otherwise have been free to take part, and possibly have turned the scale, in the Russian campaign.

To summarize:

- a. Air power is now a definite factor in war and must be regarded as on the same plane as sea power and land power.
- b. Our resources are not unlimited; we must use every one not only to its fullest extent but in the most effective manner, and all integrated by the War Cabinet.
- c. To obtain full value from aircraft we must make the best use of their offensive power, flexibility, and ubiquity. To ensure this, as well as rapid concentration of air power for any particular object, centralized control is necessary.
- d. True progress and economy of force will only be achieved by training our minds to develop a three-Service rather than a one-Service outlook.



# Book Reviews

## SINGAPORE IS SILENT

BY GEORGE WELLER

312 pages . . . Harcourt, Brace & Co., New York.

The author, Mr. George Weller, an overseas correspondent of the *Chicago Daily News*, was in Malaya during the campaign the Japanese waged on that peninsula, and experienced the bombing and shelling of Singapore during the final stages of that port's defense. His observations are set down in lucid and readable style.

Of considerable interest are the descriptions of Japanese combat methods and tactics, which, while not coming from a professional soldier are, nevertheless, valuable being based, as they are, on first hand information. Mr. Weller is much impressed with the ingenuity and skill of the Japanese soldier and his particular adaptability for jungle warfare. Special attention is given to effective stratagems the enemy employed in close combat, his sniper technique, camouflage, clever employment of cyclists, etc.

While the book, as a whole, is a newspaperman's account of a tragic chapter in this war, with much of its contents devoted to travelogue, censorship troubles, and some local color, there is enough useful military information in it to recommend it to the military reader.

## ONE WORLD

BY WENDELL L. WILLKIE

206 pages . . . Simon & Schuster, New York.

The 1940 Republican presidential candidate made a trip by airplane which in forty-nine days took him to the fighting fronts in Africa, China, and Russia. Wherever he visited Mr. Willkie spoke with people in all walks of life—rulers, statesmen, military leaders, workers, and farmers. From them he gained a comprehensive knowledge of the attitude of the peoples involved in this war towards the U. S. as their ally, and of the great hopes reposed by them in American assistance in the common struggle.

Of more immediate interest to the military reader are Mr. Willkie's vivid descriptions of the personalities of military leaders in the countries he visited. The British General Montgomery, the French General de Gaulle, the Russian Joseph Stalin and Lieutenant General Lelyushenko, and the Chinese Generalissimo Chiang Kai Shek and his brilliant wife, all these and many others were among those who entertained the distinguished American. Their thoughts, as expressed to Mr. Willkie, are at once significant and absorbingly interesting.

"One World" is recommended for a better understanding of the scope of this global war.

## ATTACK CAN WIN IN '43

BY MAX WERNER

216 Pages . . . Little, Brown & Co., Boston.

Mr. Werner makes a strong plea for an Allied invasion of Europe this year. He believes that the German army is no longer able to withstand a simultaneous pressure by both the Russians in the east and the Anglo-American allies in the west. Basing his contentions on copious references to German military writers, Mr. Werner maintains that since the failure of their original plan of a speedy defeat of the Red Army, the German high command has been unable to evolve a new over-all strategic plan to cope with the changed situation. This, coupled with the great losses sustained in Russia and the loss of Africa, renders the Germans vulnerable. Mr. Werner recommends: 1, the main effort from the British Isles to Europe (France); 2, flanking operations based from the British Isles to Northern Europe (Scandinavia), and from Africa to Southern Europe; 3, diversionary actions against coasts of Western France, Belgium, Holland, Denmark, Italy, and the Balkans. Several auxiliary strategic plans are recommended such as, for instance, the junction of allied and Soviet naval forces in the Baltic effecting a blockade of the German coast from Memel to Kiel. All this would be accompanied by a simultaneous land drive by the Russian forces. The author contends that such a great pressure from without would bring about the collapse of the German army.

Max Werner is a native of Russia who has lived in Germany for many years. The several books he has written about the present war show his knowledge of the military literature of many countries.

## VICTORIES OF ARMY MEDICINE

BY COLONEL EDGAR ERSKINE HUME, M.C.

250 pages . . . J. B. Lippincott Co., Philadelphia, Pa.

The Army Medical Corps has for many years excelled in research work against yellow fever whose curb through the endeavors of the late General Walter Reed was a blessing to mankind, and in many other fields of medicine such as smallpox vaccination, water purification methods through the use of liquid chlorine, the use of ultraviolet ray for tuberculosis control, as well as in ventilation, nutrition, and diabetes. The efforts of the Army Medical Corps in these and other fields are amply described in Colonel Hume's book.

At this particular time, when our Army is called upon to fight in distant lands and in every climate, the publication of a book such as *Victories of Army Medicine* helps in placing the Army's medical service in its proper perspective.

## MILITARY SKI MANUAL

BY FRANK HARPER

393 pages . . . The Military Service Publishing Co., Harrisburg, Pa.

The "Military Ski Manual" by Mr. Frank Harper is a non-service work dealing with operations in the snow. As is frequently the case, a clear distinction between ski troops and mountain troops is not made. Mountain troops must be able to ski, but ski troops are not necessarily mountaineers. Reading the book gives the impression that mountain warfare runs on skis ninety per cent of the time and that the well known "shanks mare" is called on for the remaining ten per cent only. Unfortunately, the converse is closer to reality.

Also the book indulges in that well known American trait of glamorizing some aspects of modern war, in this case ski war. There is no glamor anywhere. The first three chapters deal in glittering tactical and organizational generalities and will have small interest to the military reader. The bulk of the book deals with the basic essentials of ski technique and with the problem of life in extreme cold and at high altitudes. This portion of the book should be of great interest to anyone interested in such problems. The last few chapters are devoted to historical sketches dealing with mountain divisions for current estimates do not credit them with such strong alpine units.

## JAPAN'S PURPOSE IN ASIA

BY SIR FREDERICK WHYTE, K. C. S. I.

61 Pages . . . The Royal Institute of International Affairs, London.

In the small space of this study, Sir Frederick Whyte ably traces the course of Japan's foreign policy since 1868, through the period of her alliance with Britain to her present alliance with the Axis. The study was completed in October, 1941, before the Japanese entered upon their war with the United Nations, and the author's analyses of Japan's strategic position and war potentials have now lost much of their practical value. However, Sir Frederick's presentation of the backgrounds, principles, and purposes of Japan's "New Order"—not only economic and political, but moral and idealistic—contains much of interest, enabling the reader better to understand the determination of the Japanese to promote what they believe to be their "Asiatic Mission."

Sir Frederick Whyte has had intimate contact with the Orient. He was President of the Legislative Assembly in India from 1920 to 1925 and was Political Adviser to the National Government of China from 1929 to 1932, and he is also the author of several books on Asia. His writing gives evidence of his knowledge and experience.

# Subject Index

## LIST OF PERIODICALS INDEXED AND KEY TO ABBREVIATIONS

**Aero** = Aeroplane (Great Britain)  
**Air Force** = Air Force  
**A Med Bul** = Army Medical Bulletin  
**Amer Rif** = American Rifleman  
**Art Rund** = Artilleristische Rundschau (Germany)  
**Cav Jour** = Cavalry Journal  
**CA Jour** = Coast Artillery Journal  
**An Cos** = An Cosantoir (Eire)  
**Def Nac** = A Defesa Nacional (Brazil)  
**Deut Wr** = Deutsche Wehr (Germany)  
**Ejército** = Ejército (Spain)  
**FA Jour** = Field Artillery Journal  
**Ftg Forc** = Fighting Forces (Great Britain)  
**Geog Jour** = Geographical Journal (Great Britain)  
**Inf Jour** = Infantry Journal  
**Jour RAMC** = Journal of the Royal Army Medical Corps  
**Jour R Art** = Journal of the Royal Artillery (Great Britain)  
**Jour RUSI** = Journal of the Royal United Service Institution (Great Britain)

**Kras** = Krasnaya Zvezda (U.S.S.R.)  
**Luft** = Luftwissen (Germany)  
**MC Gaz** = Marine Corps Gazette  
**Mil-Woch** = Militär-Wochenblatt (Germany)  
**Mil Eng** = Military Engineer  
**Mil Surg** = Military Surgeon  
**Nav Inst Proc** = Naval Institute Proceedings  
**Our Army** = Our Army  
**Panzer** = Die Panzertruppe (Germany)  
**Pion** = Vierteljahreshefte für Pioniere (Germany)  
**Rev Mil** = Revista Militar (Argentina)  
**Tank** = The Tank (Great Britain)  
**Die Wehr** = Die Wehrmacht (Germany)  
**Wehr Mon** = Wehrtechnische Monatshefte (Germany)  
**Ws & Wr** = Wissen und Wehr (Germany)

**Fortune** = Fortune  
**Harper's** = Harper's Magazine  
**Lib** = Liberty  
**Life** = Life  
**Nat Geog** = National Geographic Magazine  
**Nat Bus** = Nation's Business  
**Newsweek** = Newsweek  
**Reader's Digest** = Reader's Digest  
**Sat Eve Post** = Saturday Evening Post  
**Sci Dig** = Science Digest  
**Scien Amer** = Scientific American  
**Times (London)** = Times (London) Weekly Edition  
**U.S. News** = United States News

### GENERAL

**Amer Leg** = American Legion Magazine  
**Amer Mer** = American Mercury  
**Collier's** = Collier's

**Jan** = January  
**Feb** = February  
**Mar** = March  
**Apr** = April  
**May** = May  
**Jun** = June  
**Jul** = July  
**Aug** = August  
**Sep** = September  
**Oct** = October  
**Nov** = November  
**Dec** = December

## A

### AFRICA

Africa's economic potentialities. (Wehr Mon — Jan 1943)  
 Aircraft maintenance in the desert. (Aero — 19 Mar 1943)  
 Armored tactics in North Africa. (Cav Jour — May-Jun 1943)  
 Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
 A day at a German command post in Tunisia. (Die Wehr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 The development of air warfare in 1942. (Jour RUSI — Feb 1943)  
 Development of combat intelligence. [See Main Article Section, Mil Rev — Jul 1943]  
 The fall of Tunis. (Life — 24 May 1943)  
 General McNair reports on American troops inaction on Tunisian front. (Life — 14 Jun 1943)  
 If you're going to mid-Africa. (Air Force — Jun 1943)  
 The Nazis' "flying box cars." (Scien Dig — Jul 1943)  
 Tank artillery in Africa. (Art Rund — Feb 1943)  
 Trouble in cans. (Collier's — 12 Jun 1943)  
 Tunisia: pattern for liberation. (Sat Eve Post — 19 Jun 1943)  
 The Tunisian campaign. (Life — 14 Jun 1943)  
 What really happened in North Africa. (Lib — 26 Jun 1943)

### AIR ARM

#### Command and Staff

Florida's combat theatre. (Air Force — Jun 1943)  
 Thirty seconds over Tokyo. (Collier's — 12 Jun 1943)  
 A working concept of morale for flight surgeons. (Mil Surg — Jun 1943)

#### Organization and Equipment

Aerial torpedo attack. (Air Force — Jun 1943)  
 Aircraft maintenance in the desert. (Aero — 19 Mar 1943)  
 The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
 Automatic dive apparatus of the Stuka. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 The bomber — our best weapon. (Scien Dig — Jul 1943)  
 Britain's amazing rooftop bombers. (Lib — 29 May 1943)  
 The development of air warfare in 1942. (Jour RUSI — Feb 1943)  
 Fighter-reconnaissance for the army. (Aero) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 Glider training as a preliminary to air service. (Ws & Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 The greatest "secret weapon" of the war: radar. (Reader's Dig — Jun 1943)  
 How navy trains its fledgling fliers: A story of fighting men and machines. (Newsweek — 7 Jun 1943)  
 The Nazis' "flying box cars." (Scien Dig — Jul 1943)  
 Preparation of an air unit for overseas movement. [See Main Article Section, Mil Rev — Jul 1943]  
 Sky sentries on guard. (Scien Amer — Jul 1943)

#### Personnel

Angels don't shoot guns. (Air Force — Jun 1943)  
 The bomber — our best weapon. (Scien Dig — Jul 1943)

Britain's amazing rooftop bombers. (Lib — 29 May 1943)  
 How navy trains its fledgling fliers: A story of fighting men and machines. (Newsweek — 7 Jun 1943)  
 "I'm proud of this generation." (Sat Eve Post — 19 Jun 1943)

### Training Tactics

Aerial torpedo attack. (Air Force — Jun 1943)  
 Air force in the winter battle. (Luft — Feb 1943)  
 Air intelligence at work. (Times — London) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 The air war in 1942. (Ws & Wr — Mar 1943)  
 Allied bombs herald invasions. (Life — 21 Jun 1943)  
 Combined bomber attacks. [See Main Article Section, Mil Rev — Jul 1943]  
 "Combined Operations." (Life — 24 May 1943)  
 Employment of air force. (Cav Jour — May-Jun 1943)  
 Florida's combat theatre. (Air Force — Jun 1943)  
 Glider training as a preliminary to air service. (Ws & Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 Notes on the submarine crisis. (Amer Mer — Jun 1943)  
 Thirty seconds over Tokyo. (Collier's — 12 Jun 1943)  
 The Tunisian campaign. (Life — 14 Jun 1943)

### AIRPORTS

The Japanese water supply on the airport at Guadalcanal. (Mil Eng — Jun 1943)

### AIR POWER

The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
 Allied bombs herald invasions. (Life — 21 Jun 1943)  
 Automatic dive apparatus of the Stuka. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 The development of air warfare in 1942. (Jour RUSI — Feb 1943)  
 The role of air power in the British war effort. (Jour RUSI — Feb 1943)  
 Sea, land and air power. (Jour RUSI — Feb 1943)

### AIR RAID SHELTERS

Unloading ships in foreign ports. [See Main Article Section, Mil Rev — Jul 1943]

### AIR RAID WARNING SERVICE

German doctrine: AA defense. (CA Jour — May-Jun 1943)

### AIR SUPPORT CONTROL

The air support command. [See Main Article Section, Mil Rev — Jul 1943]

### AIR WARFARE

Aerial torpedo attack. (Air Force — Jun 1943)  
 Air force in the winter battle. (Luft — Feb 1943)  
 The air war in 1942. (Ws & Wr — Mar 1943)  
 Angels don't shoot guns. (Air Force — Jun 1943)  
 Britain's amazing rooftop bombers. (Lib — 29 May 1943)  
 Combined bomber attacks. [See Main Article Section, Mil Rev — Jul 1943]  
 "Combined Operations." (Life — 24 May 1943)  
 Thirty seconds over Tokyo. (Collier's — 12 Jun 1943)  
 The Tunisian campaign. (Life — 14 Jun 1943)

### AMMUNITION

Armored units in street fighting. (Cav Jour — May-Jun 1943)  
 Supplementing artillery fire with tanks. [See Main Article Section, Mil Rev — Jul 1943]

### ANIMALS

Dogs in war. (CA Jour — May-Jun 1943)

### ANTIAIRCRAFT ARTILLERY

An encirclement by antiaircraft guns and tanks. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 Mixed batteries. (CA Jour — May-Jun 1943)  
 The newest thing in AA: airborne batteries. (CA Jour — May-Jun 1943)  
 The S-2: his functions and responsibilities. (CA Jour — May-Jun 1943)

### ANTIAIRCRAFT DEFENSE

German doctrine: AA defense. (CA Jour — May-Jun 1943)

### ANTITANK [See also Tank Destroyers]

Arrangement of combat fire of the tank hunting platoon or half-platoon. (Panzer — Dec 1942)  
 Barrages or concentrations? (Ftg Forc — Apr 1943)  
 Developing antitank. (FA Jour — Jun 1943)  
 Overcoming antitank and anti-infantry obstacles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 Tactical employment of antitank rifles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 Where war surprises are born. (Scien Amer — Jun 1943)  
 Winter movement of medium and light antitank guns. (Panzer — Feb 1943)

### ARMORED FORCES

Antiaircraft with armored divisions. (CA Jour — May-Jun 1943)  
 Armored tactics in North Africa. (Cav Jour — May-Jun 1943)  
 Armored units in street fighting. (Cav Jour — May-Jun 1943)  
 Assault training. [See Main Article Section, Mil Rev — Jul 1943]  
 Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
 German cavalry in Russia, 1941. (Cav Jour — May-Jun 1943)  
 How should a tank formation attack a bridge? (Panzer — Feb 1943)  
 The reconnaissance squadron in the motorized division. (Cav Jour — May-Jun 1943)  
 Tank combat and defense organization against armored vehicles in offense. (Def Nac — 10 Dec 1942)  
 We train our armored force. (Harper's — Jun 1943)

### ARTILLERY

#### Organization and Equipment

Air danger zone of friendly artillery. (FA Jour — Jun 1943)  
 Artillery at El Alamein. (FA Jour — Jun 1943)  
 Barrages or concentrations? (Ftg Forc — Apr 1943)  
 Division field artillery in the defense. [See Main Article Section, Mil Rev — Jul 1943]  
 Massing the fires of division and corps artillery. (FA Jour — Jun 1943)  
 Offense and the self-propelled gun. (Jour R Art — Apr 1943)

# SUBJECT INDEX

Organization of the field artillery regiment. (Jour R Art — Apr 1943)  
Range-finding. (Amer Rif — Jun 1943)  
Supplementing artillery fire with tanks. [See Main Article Section, Mil Rev — Jul 1943]

## Training Tactics

Artillery at El Alamein. (FA Jour — Jun 1943)  
Artillery escort for tanks in attack. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Bugs and boners. (FA Jour — Jun 1943)  
Good cooperation between infantry and artillery. (Art Rund — Feb 1943)  
Massing the fires of division and corps artillery. (FA Jour — Jun 1943)  
Offense and the self-propelled gun. (Jour R Art — Apr 1943)  
Tank artillery in Africa. (Art Rund — Feb 1943)  
Tank artillery in the Soviet campaign. (Art Rund — Dec 1942, Feb 1943)

## ART OF WAR STRATEGY

Allied bombs herald invasions. (Life — 21 Jun 1943)  
German strategy in the present conflict. (Inf Jour — Jun 1943)  
Japan's concept of sea power. (Newsweek — 7 Jun 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)  
The role of air power in the British war effort. (Jour RUSI — Feb 1943)  
Routes into Europe. A study in terrain. (FA Jour — Jun 1943)  
Sea, land and air power. (Jour RUSI — Feb 1943)  
Two men and an army. (Reader's Dig — Jun 1943)  
The war on interior lines. [See Main Article Section, Mil Rev — Ju 1943]

## AUSTRALIA (ARMY OF)

The real Australian soldier. (Inf Jour — Jun 1943)

## B

### BALLISTICS

What happens inside the gun and why. (Jour R Art — Apr 1943)

### BARRAGE BALLOONS

Sky sentries on guard. (Scien Amer — Jul 1943)

### BARRAGES

Barrages or concentrations? (Ftg Force — Apr 1943)

### BLACKOUTS

Chemical smoke generator company. [See Main Article Section, Mil Rev — Jul 1943]

### BLOOD PLASMA

Medical miracles on the battlefield. (Amer Mer — Jun 1943)  
Saving lives of our wounded: modern medicine at the front. (U.S. News — 21 May 1943)

### BREAKTHROUGH OPERATIONS

A bridge under water. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

## C

### CAMOUFLAGE

Chemical smoke generator company. [See Main Article Section, Mil Rev — Jul 1943]  
Streamlined camouflage. (Our Army — Jun 1943)

### CAVALRY

#### Training Tactics

German cavalry in Russia, 1941. (Cav Jour — May-Jun 1943)  
Mountain cavalry. (Rev Mil — Jan 1943)

### CENSORSHIP (MILITARY)

Military censorship. (FA Jour — Jun 1943)

### CHEMICAL SERVICE

Chemical smoke generator company. [See Main Article Section, Mil Rev — Jul 1943]  
Colored smokes for identification. (Inf Jour — Jun 1943)

### CHINA (ARMY OF)

Portrait of a Chinese soldier. (Sat Eve Post — 5 Jun 1943)

### CIVIL DISTURBANCES

Activation of a service command school for training state guard personnel. [See Main Article Section, Mil Rev — Jul 1943]

### CLIMATE

European weather. (Air Force — Jun 1943)

### COAST ARTILLERY

Antiaircraft with armored divisions. (CA Jour — May-Jun 1943)  
Assignment of targets. (CA Jour — May-Jun 1943)

### COMBINED OPERATIONS

The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
The army and navy staff college. [See Main Article Section, Mil Rev — Jul 1943]  
Combined bomber attacks. [See Main Article Section, Mil Rev — Jul 1943]

### COMMANDOS

"Combined Operations." (Life — 24 May 1943)

## COMMAND, STAFF, AND LOGISTICS

A.E.F. general staff, World War I. [See Main Article Section, Mil Rev — Jul 1943]  
G-2 says — "I don't know." [See Main Article Section, Mil Rev — Jul 1943]

## COMMUNICATION

The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
The struggle for lines of communications in winter. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Unloading ships in foreign ports. [See Main Article Section, Mil Rev — Jul 1943]

## CONCEALMENT

TD fundamentals. (FA Jour — Jun 1943)

## CONCENTRATIONS

Barrages or concentrations? (Ftg Force — Apr 1943)

## CONVOYS

This is a war of ship tons. [See Main Article Section, Mil Rev — Jul 1943]

## COOPERATION

The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
Employment of air force. (Cav Jour — May-Jun 1943)  
General McNair reports on American troops in action on Tunisian front. (Life — 14 Jun 1943)  
Good cooperation between infantry and artillery. (Art Rund — Feb 1943)  
Personal impressions of the medical services in the present war. (Jour RAMC — Feb 1943)

## COURTS MARTIAL

Military justice in the German army. (Ejercito) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

## D

### DEFENSIVE COMBAT

See Tactics Operations

### DISCIPLINE

Army morale and its relation to discipline and efficiency. (Ftg Force — Apr 1943)  
Panic — a decisive factor in war. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

### DISEASES

If you're going to mid-Africa. (Air Force — Jun 1943)

## E

### EASTERN THEATER

The attack across the Don northwest of Kalatsch. (Pion) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
A bridge under water. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Capture of a village at night. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Construction troops at Sevastopol. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
An encirclement by antiaircraft guns and tanks. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The struggle for lines of communications in winter. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

### ECONOMICS

Africa's economic potentialities. (Wehr Mon — Jan 1943)  
Economic warfare. (Jour RUSI — Feb 1943)  
The influence of war economics on strategy. (Wehr Mon — Jan 1943)  
Significance of Japanese military operations on the economic war in the Far East. (Wehr Mon — Jan 1943)  
Trade with the devil. (Sat Eve Post — 29 May 1943)

### EMBARKATION

Preparation of an air unit for overseas movement. [See Main Article Section, Mil Rev — Jul 1943]

### ENCIRCLEMENT

The attack across the Don northwest of Kalatsch. (Pion) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
An encirclement by antiaircraft guns and tanks. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

### ENGINEERS

The attack across the Don northwest of Kalatsch. (Pion) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
A bridge under water. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Construction troops at Sevastopol. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The Japanese water supply on the airport at Guadalcanal. (Mil Eng — Jun 1943)  
New bamboo revetment construction. (Mil Eng — Jun 1943)  
Overcoming antitank and anti-infantry obstacles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

The signal section of engineer battalions of the German army. (Rev Mil — Jan 1943)  
Trouble in cans. (Collier's — 12 Jun 1943)

## F

### FLAME THROWERS

Flame throwers vs. artillery. (Scien Dig — Jul 1943)

### FORTIFICATIONS

The Greek land fortifications. (Wehr Mon — Mar 1943)

### FRANCE (ARMY OF)

What really happened in North Africa. (26 Jun 1943)

## G

### GERMANY

Economic warfare. (Jour RUSI — Feb 1943)  
The influence of war economics on strategy. (Wehr Mon — Jan 1943)  
Organization Todt. (Inf Jour — Jun 1943)

### GERMANY (ARMY OF)

#### Command and Staff

A day at a German command post in Tunisia. (Die Wehr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
German strategy in the present conflict. (Inf Jour — Jun 1943)  
Suggestions for command upon commitment of a detachment. (Art Rund — Mar 1943)  
Training methods. (Panzer — Dec 1942)

#### Organization and Equipment

Automatic dive apparatus of the Stuka. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Glider training as a preliminary to air service. (Ws & Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Military justice in the German army. (Ejercito) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The Nazis' "flying box cars." (Scien Dig — Jul 1943)  
Regarding the development of the field gun and AA gun mounts. (Wehr Mon — Feb 1943)  
The war on interior lines. [See Main Article Section, Mil Rev — Jul 1943]

#### Training Tactics

Air force in the winter battle. (Luft — Feb 1943)  
The air war in 1942. (Ws & Wr — Mar 1943)  
Arrangement of combat fire of the tank hunting platoon or half-platoon. (Panzer — Dec 1942)  
German cavalry in Russia, 1941. (Cav Jour — May-Jun 1943)  
German doctrine: AA defense. (CA Jour — May-Jun 1943)  
The signal section of engineer battalions of the German army. (Rev Mil — Jan 1943)  
Tank artillery in Africa. (Art Rund — Feb 1943)  
Tank artillery in the Soviet campaign. (Art Rund — Dec 1942, Feb 1943)  
Training methods. (Panzer — Dec 1942)

### GERMANY (NAVY OF)

The deadly menace of the U-boat: The power and possibilities of Germany's underwater wolves. [See Main Article Section, Mil Rev — Jul 1943]

### GOVERNMENT (MILITARY)

Legislation prevailing in occupied enemy territory. (Rev Mil — Jan 1943)  
Military justice in the German army. (Ejercito) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

### GREAT BRITAIN (ARMY OF)

#### Command and Staff

Surprise proof morale. (Jour R Art — Apr 1943)  
Two men and an army. (Reader's Dig — Jun 1943)

#### Organization and Equipment

Aircraft maintenance in the desert. (Aero — 19 Mar 1943)  
Army medical services in action. (Tank — May 1943)  
Britain's amazing rooftop bombers. (Lib — 29 May 1943)  
The development of air warfare in 1942. (Jour RUSI — Feb 1943)  
Fighter-reconnaissance for the army. (Aero) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The role of air power in the British war effort. (Jour RUSI — Feb 1943)

#### Personnel

Mixed batteries. (CA Jour — May-Jun 1943)

#### Training Tactics

"Combined Operations." (Life — 24 May 1943)  
Surprise proof morale. (Jour R Art — Apr 1943)  
Training British tank crews. (Cav Jour — May-Jun 1943)  
The Tunisian campaign. (Life — 14 Jun 1943)

### GREAT BRITAIN (NAVY OF)

"Combined Operations." (Life — 24 May 1943)

### GREECE (ARMY OF)

The Greek land fortifications. (Wehr Mon — Mar 1943)

### GUADALCANAL

Island of victory. (Amer Leg — Jun 1943)



## MILITARY REVIEW

### M

The Japanese water supply on the airport at Guadalcanal. (Mil Eng — Jun 1943)  
Jungle fighting. (Cav Jour — May-Jun 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)

#### GUERRILLA WARFARE

Guerrilla warfare in former Jugo-Slavia. (Die Wehr — 14 Apr 1943)  
Trained guerrilla troops behind the enemy lines. (Cav Jour — May-Jun 1943)

### I

#### INFANTRY

##### Organization and Equipment

A guide for standing operating procedure for the medical battalion — infantry division. (Mil Surg — Jun 1943)  
Use of motor vehicles of the infantry division. [See Main Article Section, Mil Rev — Jul 1943]

##### Training Tactics

Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Good cooperation between infantry and artillery. (Art Rund — Feb 1943)  
The lesson of one battle. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

#### INSIGNIA (MILITARY)

Aircraft insignia, spirit of youth. (Nat Geog — Jun 1943)  
The traditions and glamour of insignia. (Nat Geog — Jun 1943)

#### INTELLIGENCE (MILITARY)

Air intelligence at work. (Times — London) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Development of combat intelligence. [See Main Article Section, Mil Rev — Jul 1943]  
G-2 says — "I don't know." [See Main Article Section, Mil Rev — Jul 1943]  
The S-2: his functions and responsibilities. (CA Jour — May-Jun 1943)

#### IRAN

The Persian link with Russia: an appreciation of the situation. (Jour R Art — Apr 1943)

#### ITALY

Allied bombs herald invasions. (Life — 21 Jun 1943)

### J

#### JAPAN

Significance of Japanese military operations on the economic war in the Far East. (Wehr Mon — Jan 1943)

#### JAPAN (ARMY OF)

How brave is the Jap? [See Main Article Section, Mil Rev — Jul 1943]  
Japanese operations in New Guinea. (Geog Jour — Mar 1943)  
Japanese training. Has it a lesson for us? (An Cos — Apr 1943)  
The Japanese water supply on the airport at Guadalcanal. (Mil Eng — Jun 1943)  
Philippine campaign. (Cav Jour — May-Jun 1943)

#### JAPAN (NAVY OF)

Battle at Bali. (Nav Inst Proc — Jun 1943)  
Japan's concept of sea power. (Newsweek — 7 Jun 1943)

#### JOINT OPERATIONS

"Combined Operations." (Life — 24 May 1943)

#### JUNGLE

Jungle fighting. (Cav Jour — May-Jun 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)  
What we learned in New Guinea. (Fortune — Jun 1943)

### L

#### LARGE UNITS

##### Corps

The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
Massing the fires of division and corps artillery. (FA Jour — Jun 1943)

##### Division

Antiaircraft with armored divisions. (CA Jour — May-Jun 1943)  
Division field artillery in the defense. [See Main Article Section, Mil Rev — Jul 1943]  
Massing the fires of division and corps artillery. (FA Jour — Jun 1943)  
The reconnaissance squadron in the motorized division. (Cav Jour — May-Jun 1943)  
Use of motor vehicles of the infantry division. [See Main Article Section, Mil Rev — Jul 1943]

#### LEADERSHIP

Developing leadership in young officers. [See Main Article Section, Mil Rev — Jul 1943]  
Officer candidate school. (Life — 7 Jun 1943)

#### LEND-LEASE

This is a war of ship tons. [See Main Article Section, Mil Rev — Jul 1943]

#### LIBYA

Trained guerilla troops behind the enemy lines. (Cav Jour — May-Jun 1943)

#### MALTA

The development of air warfare in 1942. (Jour RUSI — Feb 1943)

#### MANEUVERS

Desert "As is." (FA Jour — Jun 1943)

#### MARINE CORPS

Island of victory. (Amer Leg — Jun 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)

#### MECHANIZATION

Tactical employment of antitank rifles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Tank combat and defense organization against armored vehicles in offense. (Def Nac — 10 Dec 1942)

#### MEDICAL SERVICE

Army medical services in action. (Tank — May 1943)  
The forward medical services of the Red army. (Jour RAMC — Feb 1943)  
A guide for standing operating procedure for the medical battalion — infantry division. (Mil Surg — Jun 1943)  
If you're going to mid-Africa. (Air Force — Jun 1943)  
Medical miracles on the battlefield. (Amer Mer — Jun 1943)  
Mozzie surgical units. (A Med Bul — [See "Foreign Military Digests" Section, Mil Rev — Jul 1943])  
Observations on military sanitation. (Jour RAMC — Feb 1943)  
Parachute injuries. (A Med Bul — Apr 1943)  
Personal impressions of the medical services in the present war. (Jour RAMC — Feb 1943)  
Psychiatric casualties: Hints to medical officers in the Middle East forces. (A Med Bul — Apr 1943)  
Saving lives of our wounded: modern medicine at the front. (U.S. News — 21 May 1943)  
Who's afraid of malaria? (Our Army — Jun 1943)  
A working concept of morale for flight surgeons. (Mil Surg — Jun 1943)

#### MERCHANT MARINES

This is a war of ship tons. [See Main Article Section, Mil Rev — Jul 1943]

#### MIDDLE EAST

Two men and an army. (Reader's Dig — Jun 1943)

#### MINES

Minesweeping. (Jour RUSI — Feb 1943)  
Overcoming antitank and anti-infantry obstacles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Trouble in cans. (Collier's — 12 Jun 1943)

#### MOBILIZATION

What it's like in the army. (Harper's — Jun 1943)

#### MORALE

Army morale and its relation to discipline and efficiency. (Fig Fore — Apr 1943)  
Surprise proof morale. (Jour R Art — Apr 1943)  
A working concept of morale for flight surgeons. (Mil Surg — Jun 1943)

#### MOTORIZATION

Desert "As is." (FA Jour — Jun 1943)  
Our amazing blitz buggy. (Lio — 19 Jun 1943)  
The reconnaissance squadron in the motorized division. (Cav Jour — May-Jun 1943)  
Unloading ships in foreign ports. [See Main Article Section, Mil Rev — Jul 1943]  
Use of motor vehicles of the infantry division. [See Main Article Section, Mil Rev — Jul 1943]

#### MOVIES

Soldiers-by-celluloid! (Amer Leg — Jun 1943)

### N

#### NAVAL WARFARE

Battle at Bali. (Nav Inst Proc — Jun 1943)  
"Combined Operations." (Life — 24 May 1943)  
The deadly menace of the U-boat: The power and possibilities of Germany's underwater wolves. [See Main Article Section, Mil Rev — Jul 1943]  
Minesweeping. (Jour RUSI — Feb 1943)  
Notes on the submarine crisis. (Amer Mer — Jun 1943)

#### NEW GUINEA

"I'm proud of this generation." (Sat Eve Post — 19 Jun 1943)  
Japanese operations in New Guinea. (Geog Jour — Mar 1943)  
What we learned in New Guinea. (Fortune — Jun 1943)

#### NIGHT OPERATIONS

Capture of a village at night. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
How to use your eyes at night. (Cav Jour — May-Jun 1943)  
Night training with the L.D.F. (Land Defense Force) (An Cos — Apr 1943)

### O

#### OBSERVATION

Armored units in street fighting. (Cav Jour — May-Jun 1943)

#### OBSTACLES

Overcoming antitank and anti-infantry obstacles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

#### OCCUPATION (MILITARY)

Legislation prevailing in occupied enemy territory. (Rev Mil — Jan 1943)  
Tunisia: pattern for liberation. (Sat Eve Post — 19 Jun 1943)

#### OCEAN SHIPPING

This is a war of ship tons. [See Main Article Section, Mil Rev — Jul 1943]  
Unloading ships in foreign ports. [See Main Article Section, Mil Rev — Jul 1943]

#### OFFENSIVE COMBAT

See Tactics Operations

### P

#### PARACHUTES

Parachute injuries. (A Med Bul — Apr 1943)

#### PHILIPPINE ISLANDS

Philippine campaign. (Cav Jour — May-Jun 1943)

#### PHOTOGRAPHY

Allied bombs herald invasions. (Life — 21 Jun 1943)  
Guerrilla warfare in former Jugo-Slavia. (Die Wehr — 14 Apr 1943)

#### PHYSICAL FITNESS

Psychology for the fighting man. (Inf Jour — Jun 1943)  
Sick call in the army. (Nat Bus — Jun 1943)

#### POLAND

The Polish campaign of 1939. (Rev Mil — Jan 1943)

#### PORT AGENCY

This is a war of ship tons. [See Main Article Section, Mil Rev — Jul 1943]  
Unloading ships in foreign ports. [See Main Article Section, Mil Rev — Jul 1943]

#### PREPAREDNESS (MILITARY)

Policy of preparedness. (Mil Eng — Jun 1943)

#### PRISONERS OF WAR

Our growing prison camps: how U.S. treats war captives. (U.S. News — 28 May 1943)

#### PRODUCTION (WAR)

Where war surprises are born. (Scien Amer — Jun 1943)

#### PROPAGANDA

Propaganda in war. (Jour RUSI — Feb 1943)

#### PSYCHOLOGY (MILITARY)

How brave is the Jap? [See Main Article Section, Mil Rev — Jul 1943]  
Japanese training. Has it a lesson for us? (An Cos — Apr 1943)  
Panic — a decisive factor in war. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Portrait of a Chinese soldier. (Sat Eve Post — 5 Jun 1943)  
Psychology for the fighting man. (Inf Jour — Jun 1943)

### R

#### RADIO

Bunker communication installation in firing position. (Art Rund — Nov 1943)  
The greatest "secret weapon" of the war: radar. (Reader's Dig — Jun 1943)  
Radar secrets are revealed. (Scien Dig — Jul 1943)

#### RECONNAISSANCE

Armored units in street fighting. (Cav Jour — May-Jun 1943)  
Combat reconnaissance in a tank engagement. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Development of combat intelligence. [See Main Article Section, Mil Rev — Jul 1943]  
The reconnaissance squadron in the motorized division. (Cav Jour — May-Jun 1943)

#### RECONNAISSANCE (AERIAL)

The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
Fighter-reconnaissance for the army. (Aero) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

#### RIVER CROSSINGS

The attack across the Don northwest of Kalatsch. (Pion) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
A bridge under water. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

#### ROUTES COMMUNICATIONS

##### Bridges Bridging

A bridge under water. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Construction troops at Sevastopol. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Organization Todt. (Inf Jour — Jun 1943)

# SUBJECT INDEX

**Highways Military Roads**  
Organization Todt. (Inf Jour — Jun 1943)

**Railways**  
The Persian link with Russia: An appreciation of the situation. (Jour R Art — Apr 1943)  
Planning an administrative rail movement. [See Main Article Section, Mil Rev — Jul 1943]

**RUSSIA**  
The Persian link with Russia: an appreciation of the situation. (Jour R Art — Apr 1943)  
Spitzbergen. (Ws & Wr — Feb 1943)

**RUSSIA (ARMY OF)**  
A bridge under water. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Combined bomber attacks. [See Main Article Section, Mil Rev — Jul 1943]  
The forward medical services of the Red army. (Jour RAMC — Feb 1943)  
The lessons of one battle. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Overcoming antitank and anti-infantry obstacles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Portrait of the Red soldier. (Inf Jour — Jun 1943)  
The Red officer corps. (Inf Jour — Jun 1943)  
Russian defensive methods. (An Cos — Apr 1943)

## S

**SEA POWER**  
Japan's concept of sea power. (Newsweek — 7 Jun 1943)  
Sea, land and air power. (Jour RUSI — Feb 1943)

**SECURITY**  
Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Development of combat intelligence. [See Main Article Section, Mil Rev — Jul 1943]

**SIGNAL COMMUNICATIONS**  
Bunker communication installation in firing position. (Art Rund — Nov 1942)  
Increasing fire preparedness in defense. (Art Rund — Dec 1942)

**SIGNAL SERVICE**  
The signal section of engineer battalions of the German army. (Rev Mil — Jan 1943)

**STATE GUARD**  
Activation of a service command school for training state guard personnel. [See Main Article Section, Mil Rev — Jul 1943]

**ST. NAZAIRE**  
"Combined Operations." (Life — 24 May 1943)

**SULFANILAMIDE**  
Medical miracles on the battlefield. (Amer Mer — Jun 1943)  
Saving lives of our wounded: modern medicine at the front. (U.S. News — 21 May 1943)

**SUPPLY**  
The Japanese water supply on the airport at Guadalcanal. (Mil Eng — Jun 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)  
The Persian link with Russia: an appreciation of the situation. (Jour R Art — Apr 1943)  
Trade with the devil. (Sat Eve Post — 29 May 1943)  
Use of motor vehicles of the infantry division. [See Main Article Section, Mil Rev — Jul 1943]

## T

**TACTICS OPERATIONS**  
**Defensive Combat**  
Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
Division field artillery in the defense. [See Main Article Section, Mil Rev — Jul 1943]  
Increasing fire preparedness in defense. (Art Rund — Dec 1942)  
Russian defensive methods. (An Cos — Apr 1943)  
Tank combat and defense organization against armored vehicles in offense. (Def Nac — 10 Dec 1942)

**Offensive Combat**  
The advance. (Jour RUSI — Feb 1943)  
The air support command. [See Main Article Section, Mil Rev — Jul 1943]  
Armored tactics in North Africa. (Cav Jour — May-Jun 1943)  
Artillery escort for tanks in attack. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The attack across the Don northwest of Kalatsch. (Pion) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Barrages or concentrations? (Ftg Fore — Apr 1943)  
Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
Developing successful attack by fighting at night. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
An encirclement by anti-aircraft guns and tanks. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
German cavalry in Russia, 1941. (Cav Jour — May-Jun 1943)  
How should a tank formation attack a bridge? (Panzer — Feb 1943)  
The lessons of one battle. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

Offense and the self-propelled gun. (Jour R Art — Apr 1943)  
Philippine campaign. (Cav Jour — May-Jun 1943)  
The Red officer corps. (Inf Jour — Jun 1943)  
Tank combat and defense organization against armored vehicles in offense. (Def Nac — 10 Dec 1942)  
TD fundamentals. (FA Jour — Jun 1943)  
The war on interior lines. [See Main Article Section, Mil Rev — Jul 1943]

## Special Warfare

Armored units in street fighting. (Cav Jour — May-Jun 1943)  
Capture of a village at night. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Desert "As is." (FA Jour — Jun 1943)  
Fights in inhabited places. (Rev Mil — Jan 1943)  
Fire cooperation in the mountains. (Art Rund — Dec 1942)  
Guerrilla warfare in former Jugo-Slavia. (Die Wehr — 14 Apr 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)  
Mountain operations. (Rev Mil — Jan 1943)  
Two men and an army. (Reader's Dig — Jun 1943)  
What we learned in New Guinea. (Fortune — Jun 1943)  
Winter movement of medium and light antitank guns. (Panzer — Feb 1943)

**TANK DESTROYERS** [See also Antitank]  
Arrangement of combat fire of the tank hunting platoon or half-platoon. (Panzer — Dec 1942)  
Developing antitank. (FA Jour — Jun 1943)  
TD fundamentals. (FA Jour — Jun 1943)  
Where war surprises are born. (Scien Amer — Jun 1943)

**TANKS**  
Armored tactics in North Africa. (Cav Jour — May-Jun 1943)  
Artillery escort for tanks in attack. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Colored smokes for identification. (Inf Jour — Jun 1943)  
Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
Combat reconnaissance in a tank engagement. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
An encirclement by anti-aircraft guns and tanks. (Deut Wr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Flame throwers vs. artillery. (Scien Dig — Jul 1943)  
How should a tank formation attack a bridge? (Panzer — Feb 1943)  
The lessons of one battle. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Reflections regarding the doctrine of the employment of tanks. (Def Nac — 10 Dec 1942)  
Supplementing artillery fire with tanks. [See Main Article Section, Mil Rev — Jul 1943]  
Training British tank crews. (Cav Jour — May-Jun 1943)

**TERRAIN**  
Routes into Europe. A study in terrain. (FA Jour — Jun 1943)

**TRANSPORTATION**  
Our amazing blitz buggy. (Lib — 19 Jun 1943)  
Planning an administrative rail movement. [See Main Article Section, Mil Rev — Jul 1943]  
Unloading ships in foreign ports. [See Main Article Section, Mil Rev — Jul 1943]

**TRANSPORTATION (AIR)**  
The Nazis' "flying box cars." (Scien Dig — Jul 1943)

## U

**U-BOAT**  
The deadly menace of the U-boat: The power and possibilities of Germany's underwater wolves. [See Main Article Section, Mil Rev — Jul 1943]

**UNITED NATIONS**  
Notes on the submarine crisis. (Amer Mer — Jun 1943)  
Trade with the devil. (Sat Eve Post — 29 May 1943)

**UNITED STATES (ARMY OF)**  
**Command and Staff**  
A.E.F. general staff, World War I. [See Main Article Section, Mil Rev — Jul 1943]  
Everything is Jake. (Collier's — 26 Jun 1943)  
General McNair reports on American troops in action on Tunisian front. (Life — 14 Jun 1943)  
G-2 says — "I don't know." [See Main Article Section, Mil Rev — Jul 1943]  
The S-2: his functions and responsibilities. (CA Jour — May-Jun 1943)

## Organization and Equipment

Aircraft maintenance in the desert. (Aero — 19 Mar 1943)  
Our amazing blitz buggy. (Lib — 19 Jun 1943)  
Sky sentries on guard. (Scien Amer — Jul 1943)

## Personnel

Angels don't shoot guns. (Air Force — Jun 1943)  
Sick call in the army. (Nat Bus — Jun 1943)  
Tunisia: pattern for liberation. (Sat Eve Post — 19 Jun 1943)  
What it's like in the army. (Harper's — Jun 1943)  
Women of two wars. (Sat Eve Post — 29 May 1943)

## Schools

Activation of a service command school for training state guard personnel. [See Main Article Section, Mil Rev — Jul 1943]  
The army and navy staff college. [See Main Article Section, Mil Rev — Jul 1943]  
Assault training. [See Main Article Section, Mil Rev — Jul 1943]  
Developing leadership in young officers. [See Main Article Section, Mil Rev — Jul 1943]  
Florida's combat theatre. (Air Force — Jun 1943)  
Notes for instructors. [See Main Article Section, Mil Rev — Jul 1943]  
Officer candidate school. (Life — 7 Jun 1943)  
We train our armored force. (Harper's — Jun 1943)

## Training Tactics

America's grown-up army. (U.S. News — 21 May 1943)  
Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
Desert "As is." (FA Jour — Jun 1943)  
Dogs in war. (CA Jour — May-Jun 1943)  
Florida's combat theatre. (Air Force — Jun 1943)  
Jungle war against the Japs. (Scien Dig — Jul 1943)  
Range-finding. (Amer Rif — Jun 1943)  
Soldiers-by-celluloid! (Amer Leg — Jun 1943)  
Thirty seconds over Tokyo. (Collier's — 12 Jun 1943)  
The Tunisian campaign. (Life — 14 Jun 1943)

## UNITED STATES (NAVY OF)

### Personnel

How Navy trains its fledgling fliers: A story of fighting men and machines. (Newsweek — 7 Jun 1943)

### Schools

The army and navy staff college. [See Main Article Section, Mil Rev — Jul 1943]

### Training Tactics

How Navy trains its fledgling fliers: A story of fighting men and machines. (Newsweek — 7 Jun 1943)

## UNITY OF COMMAND

The army and navy staff college. [See Main Article Section, Mil Rev — Jul 1943]  
Employment of air force. (Cav Jour — May-Jun 1943)

## W

### WAR

#### UNITED STATES

**CIVIL WAR (1861-1865)**  
Policy of preparedness. (Mil Eng — Jun 1943)  
**MEXICAN WAR (1845-1848)**  
Policy of preparedness. (Mil Eng — Jun 1943)  
**SPANISH-AMERICAN WAR (1898)**  
Policy of preparedness. (Mil Eng — Jun 1943)  
**WAR OF 1812 (1812-1814)**  
Policy of preparedness. (Mil Eng — Jun 1943)

#### WORLD WAR I (1914-1918)

A.E.F. general staff, World War I. [See Main Article Section, Mil Rev — Jul 1943]  
Flame throwers vs. artillery. (Scien Dig — Jul 1943)  
Policy of preparedness. (Mil Eng — Jun 1943)  
This is a war of ship tons. [See Main Article Section, Mil Rev — Jul 1943]  
Women of two wars. (Sat Eve Post — 29 May 1943)

#### WORLD WAR II (1939- )

Africa's economic potentialities. (Wehr Mon — Jan 1943)  
Aircraft maintenance in the desert. (Aero — 19 Mar 1943)  
Air intelligence at work. (Times — London) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The air war in 1942. (Ws & Wr — Mar 1943)  
Allied bombs herald invasions. (Life — 21 Jun 1943)  
America's grown-up army. (U.S. News — 21 May 1943)  
Angels don't shoot guns. (Air Force — Jun 1943)  
Artillery at El Alamein. (FA Jour — Jun 1943)  
The attack across the Don northwest of Kalatsch. (Pion) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
Battle at Ball. (Nav Inst Proc — Jun 1943)  
Britain's amazing rooftop bombers. (Lib — 29 May 1943)  
Combined bomber attacks. [See Main Article Section, Mil Rev — Jul 1943]  
"Combined Operations." (Life — 24 May 1943)  
Comeback at Kasserine Pass. (Sat Eve Post — 29 May 1943)  
Construction troops at Sevastopol. (Mil-Woch) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
A day at a German command post in Tunisia. (Die Wehr) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
The deadly menace of the U-boat: The power and possibilities of Germany's underwater wolves. [See Main Article Section, Mil Rev — Jul 1943]  
The development of air warfare in 1942. (Jour RUSI — Feb 1943)

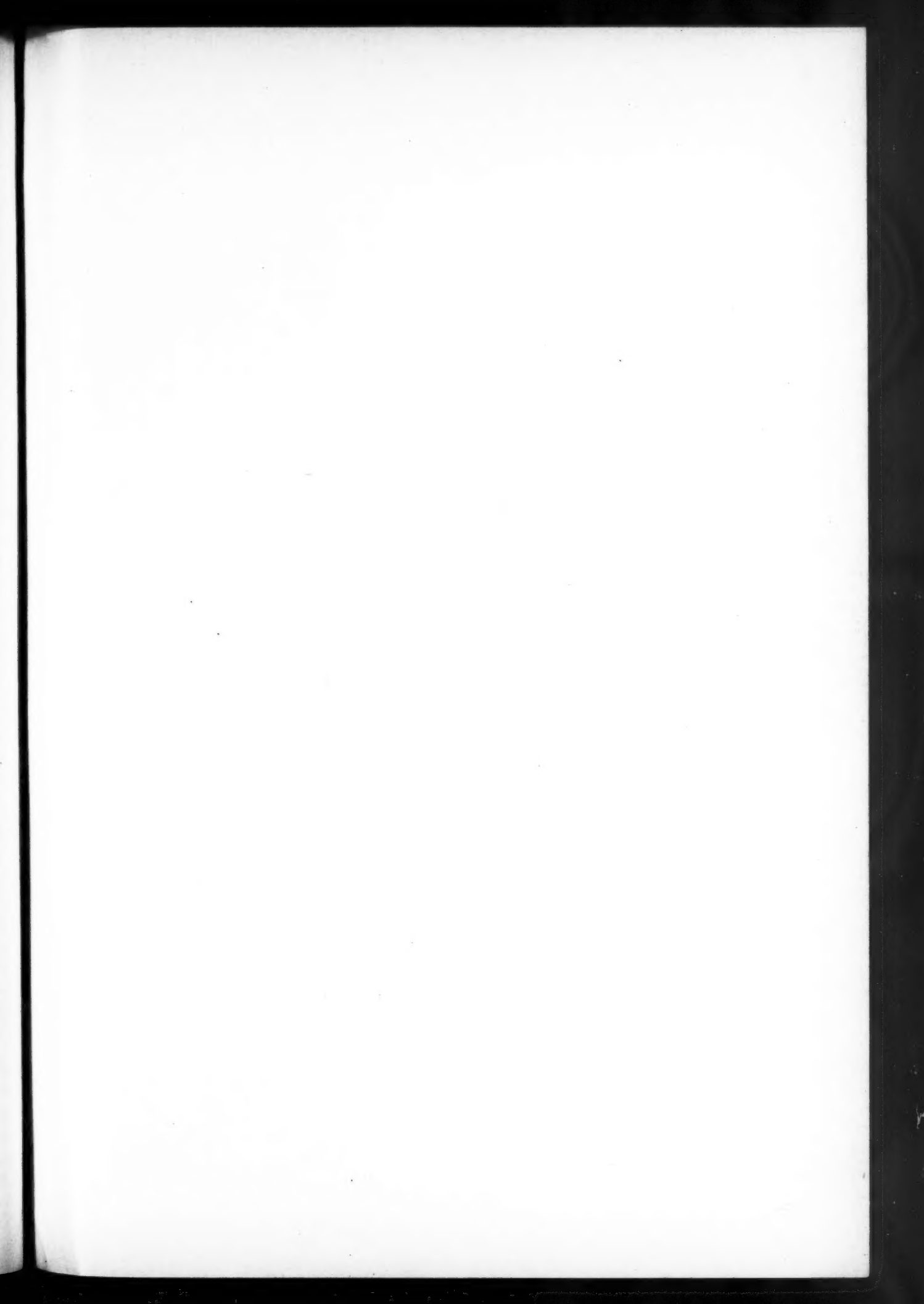
## MILITARY REVIEW

Development of combat intelligence. [See Main Article Section, Mil Rev — Jul 1943]  
 Dogs in war. (CA Jour — May-Jun 1943)  
 Employment of air force. (Cav Jour — May-Jun 1943)  
 Flame throwers vs. artillery. (Scien Dig — Jul 1943)  
 The forward medical services of the Red army. (Jour RAMC — Feb 1943)  
 General McNair reports on American troops in action on Tunisian front. (Life — 14 Jun 1943)  
 German cavalry in Russia, 1941. (Cav Jour — May-Jun 1943)  
 German strategy in the present conflict. (Inf Jour — Jun 1943)  
 How brave is the Jap? [See Main Article Section, Mil Rev — Jul 1943]  
 "I'm proud of this generation." (Sat Eve Post — 19 Jun 1943)  
 The influence of war economics on strategy. (Weh Mon — Jan 1943)  
 Island of victory. (Amer Leg — Jun 1943)  
 Japanese operations in New Guinea. (Geog Jour — Mar 1943)  
 Japanese training. Has it a lesson for us? (An Cos — Apr 1943)  
 Jungle fighting. (Cav Jour — May-Jun 1943)  
 Jungle war against the Japs. (Scien Dig — Jul 1943)  
 Mixed batteries. (CA Jour — May-Jun 1943)  
 Mobile surgical units. (A Med Bul) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]

Our amazing blitz buggy. (Lib — 19 Jun 1943)  
 Our growing prison camps: how U.S. treats war captives. (U.S. News — 28 May 1943)  
 The Persian link with Russia: an appreciation of the situation. (Jour R Art — Apr 1943)  
 Personal impressions of the medical services in the present war. (Jour RAMC — Feb 1943)  
 Policy of preparedness. (Mil Eng — Jun 1943)  
 The Polish campaign of 1939. (Rev Mil — Jan 1943)  
 Portrait of a Chinese soldier. (Sat Eve Post — 5 Jun 1943)  
 Portrait of the Red soldier. (Inf Jour — Jun 1943)  
 Radar secrets are revealed. (Scien Dig — Jul 1943)  
 The real Australian soldier. (Inf Jour — Jun 1943)  
 The Red officer corps. (Inf Jour — Jun 1943)  
 Routes into Europe. A study in terrain. (FA Jour — Jun 1943)  
 Saving lives of our wounded: modern medicine at the front. (U.S. News — 21 May 1943)  
 Sick call in the army. (Nat Bus — Jun 1943)  
 Significance of Japanese military operations on the economic war in the Far East. (Wehr Mon — Jan 1943)  
 Sky sentries on guard. (Scien Amer — Jul 1943)  
 Soldiers-by-celluloid! (Amer Leg — Jun 1943)  
 The struggle for lines of communications in winter. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 Thirty seconds over Tokyo. (Collier's — 12 Jun 1943)  
 This is a war of ship tons. [See Main Article Section

Mil Rev — Jul 1943]  
 Trade with the devil. (Sat Eve Post — 29 May 1943)  
 Trained guerilla troops behind the enemy lines. (Cav Jour — May-Jun 1943)  
 The Tunisian campaign. (Life — 14 Jun 1943)  
 Two men and an army. (Reader's Dig — Jun 1943)  
 The war on interior lines. [See Main Article Section, Mil Rev — Jul 1943]  
 What really happened in North Africa. (Lib — 26 Jun 1943)  
 What we learned in New Guinea. (Fortune — Jun 1943)  
 Women of two wars. (Sat Eve Post — 29 May 1943)  
**WEAPONS**  
 Assault training. [See Main Article Section, Mil Rev — Jul 1943]  
 The bomber — our best weapon. (Scien Dig — Jul 1943)  
 Developing antitank. (FA Jour — Jun 1943)  
 Flame throwers vs. artillery. (Scien Dig — Jul 1943)  
 The greatest "secret weapon" of the war: radar. (Reader's Dig — Jun 1943)  
 Jungle fighting. (Cav Jour — May-Jun 1943)  
 Tactical employment of antitank rifles. (Kras) [See "Foreign Military Digests" Section, Mil Rev — Jul 1943]  
 What happens inside the gun and why. (Jour R Art — Apr 1943)  
 Where war surprises are born. (Scien Amer — Jun 1943)







Technical Division,  
AC/AS Training  
Headquarters Army Air Forces,  
Washington 25, D.C.

